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ABSTRACT

Various aspects of the field of technical editing are discussed in this anthology. The 18 articles deal with the following topics: patterns for making editorial changes; the editor as generalist as well as specialist; training the editor beyond the acquisition of skills; criticism and creativity; a logical approach to editing proposals, reports, and manuals; removing the linguistic and typographic "noise" from technical writing; semantic concerns in editing; jargon; paragraphing; ambiguity; hyphens; editing by dialogue; the art of editing; the editor as teacher; the production editor; editing the small study proposal; management's responsibility in training the technical communicator; and the pitfall of editors' tending to imitate the poor styles of writing they commonly read. (A bibliography of materials that deal with the work of the technical editor is appended.) (DF)

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ANTHOLOGY SERIES NO.4

technical editing: principles and practices

Lola M. Zook, Editor May 1975

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Preface

The unwary editor who agrees to compile papers for an anthology on technical editing is in trouble in two minutes. What are we talking about and whom are we talking to? We have a particular job group, but the work assignments range from those that are almost wholly technical to those that are almost wholly editorial. The technical editor has one set of concerns in dealing with the author, a quite different set in dealing with the production people—but the overriding concern has to be for communication with the reader. We can view the editor as wordsmith or as key member of a publications team. For different practitioners and situations, we need to address very different types of problems—how to identify skills and techniques that are needed, or how to use them to good effect, or how to acquire them in the first place!

This kaleidoscope of a job description does not suffer from lack of source material. A preliminary trip through the STC Proceedings[1] and journals[2] of the past few years further enlarged the area for consideration. Many articles titled for "writers" turned out to be written for editors as well; any article that dealt with language or graphics or information retrieval or training curricula or half a dozen other topics had obvious relevance for editors.

The wealth of material available generated a first, arbitrary limitation on the selection process: It was limited to the Proceedings and STC journals for the past 10 years. My "first cut" list for 1965–1974 yielded over a hundred items, so there seemed little need to compound the problem by going back further. (I am indebted to Gerald Mann, Hyman Kana, and Thomas Naylor for their review, some years ago, of the journal articles for the years 1965–1972.)

Certain guidelines evolved during my efforts to cut the list to one-fifth its original length: (1) Articles not specifically concerned with technical editing, no matter how relevant to the work of the editor, were eliminated; (2) detailed how-to-do-it articles or those concerned with very specific job structures were eliminated unless they had clear general application; (3) articles that deal with the use of new technology or equipment were omitted because the field is constantly changing, and articles that deal with the work of the editor as a *person* seem to have more lasting value; (4) the final list reflects, to at least some degree, the wide, potential scope of the technical editor's duties.

Even with the guidelines, selection is a highly individual matter, and no two people would make the same choices. My own biases (insofar as I am aware of them) were in the direction of choosing articles that present a broad and flexible view of the editorial job, and that show respect—or self-respect—for the functions the editor serves.

The first three papers are from a single convention panel, "The Editorial Function: Basic Principles and Specific Applications." Planned as a unit, these papers—by Buehler, Cox, and Zook—provide a comprehensive statement of the editor's "world of work" and will serve as an introduction to the volume.

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[1] Proceedings of the Annual International Technical Communication Conference of the Society for Technical Communication.

[2] *Technical Communication*, the quarterly journal of the Society for Technical Communication.

The next two papers emphasize, from different viewpoints, the value of a creative and positive approach on the part of the editor. Osborne points out the opportunities, contributions, and satisfactions that can accrue from a creative view of the editorial function. Vaughn presents a philosophy of editing that provides a positive basis for constructive work, and then discusses application of that philosophy in specific assignments or proposals, reports, and manuals.

Since the editor's fundamental activity is to work with words, five papers—from a multitude of excellent candidates—were selected to reflect the kinds of problems that editors share with writers. McDonald uses some engineering concepts to introduce his ideas on eliminating "linguistic noise" and "typographic noise" from "communication systems" (technical writing). Bush links semantics principles and improved communication in "Semantics (Words Are Chameleons)." Clements' "Jargon and the Technical Writer" takes a realistic look at the problems of building new (and necessary) technical language without letting it get out of hand. Colby analyzes and discusses "Paragraphing in Technical Writing" as a tool for improving manuscript organization and effectiveness. Stratton deals with the pitfalls of identifying and resolving ambiguities as one of the major problems encountered by technical editors.

To reflect the "copy editing" aspect of the editor's work on a manuscript, I broke the rule against detailed papers to include Heffner's "Stalking the Troublesome Hyphen" as an example. I would have liked to include at least one paper dealing with style and publications guides, but other topics proved even more pressing.

The next three papers explore an attribute that contributes heavily to an editor's usefulness—ability to work effectively with authors. Briggs contrasts the obstacles and the advantages of editing by dialogue rather than editing by fiat. Dukes suggests practical approaches that the editor may take to ensure a fruitful interchange of ideas with the author. Fourdrinier characterizes the editor as a teacher, pointing out opportunities for improving the work of writers, and thus aiding in the dissemination of learning.

The work of the editor as a manager—as a key member in a publications team, or in relation to production personnel—is the topic for two papers. McGough describes a concept of a production control system in miniature, in the person of the "production editor." Rohne, in "Editing the Small Proposal," provides a description of an editor working as the coordinator/manager of a project.

The final two papers are concerned with training, considered from two very different viewpoints. Carmichael discusses management's responsibility in training the technical communicator. Brogan, in "A Pitfall for Professionals," suggests ways in which we can train ourselves to develop more lucid styles in technical literature.

My feeling as, of necessity, I complete this listing is one of regret at the number of useful and provocative papers that had to be omitted. In the hope that many of you will seek them out, I have provided a list, briefly annotated in some instances, of additional papers of interest and relevance for editors.

Even that list is only a sampling. Compiling this anthology took twice as long as I had expected, simply because I couldn't resist taking time to read all sorts of papers one step removed from the main topic. You might try the same thing, and enjoy it as much as I did.

Lola M. Zook

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From PROCEEDINGS, 1967

Patterns for Making Editorial Changes

Mary Fran Buehler

The basic technique in editing a manuscript is the making of changes. Changes are made to achieve three basic goals: clarity, appropriate language style, and appropriate mechanical style. Therefore, editorial changes may be divided into three groups: structural changes, or changes made to promote clarity of presentation; language changes, made to ensure correct and appropriate usage; and mechanical changes, which relate to the mechanics of presentation and include such matters as abbreviations and typography. General patterns underlying written technical communication furnish a guide to the making of changes. Patterns are discussed for each group of changes, and examples are given to show specific applications in the editing of manuscript.

Introduction

How do we know the kind of changes to make in a manuscript, and what criteria can we use for making them? Before we can answer these questions, we must know what we want to achieve. This leads us to the basic purpose of technical writing: what should a technical report, for example, be designed to do? Briefly, a technical report should enable the reader—if he is appropriately trained and equipped—to duplicate the investigation reported upon, in order to determine whether his results agree with those of the author.

Therefore, we can see that a technical report must, above all, be clear. It attains this clarity when it is complete, when it brings out relationships clearly, and when it is quantitative—that is, when it deals with definite numbers, amounts, and units.

Besides clarity, many qualities have been discussed as being desirable in technical writing: conciseness, consistency, good grammar, smooth writing style, and so on. These qualities can be grouped into two main goals: (a) appropriate language style, and (b) appropriate mechanical style (including typography, abbreviations, capitalization, and similar matters).

In working toward these goals, the editor thus makes three general types of changes: (a) changes to enhance clarity, such as structural changes, or changes in the arrangement or presentation of material; (b) changes to ensure appropriate language style; and (c) changes to ensure appropriate mechanical style. For convenience, we will use the terms "structural changes," "language changes," and "mechanical changes."

Patterns for Structural Changes

Several different patterns can be helpful in reviewing a manuscript for clarity. Some patterns are listed below, not necessarily in order of importance, but roughly in order of scope, as (a) the pattern of relationships, (b) the pattern of the outline, (c) the four types of technical report information, (d) the four elements of discourse, (e) the patterns of tables and graphs, and (f) the pattern of quantitative statement.

The changes made on the basis of these patterns can involve any part of a report, from the overall design to the substitution of a single word or numeral. For this reason, it has not seemed desirable, or even possible, to discuss the changes themselves in detail, although examples are included.

The Pattern of Relationships

Clear technical writing must bring out clearly the relationships among the items (ideas or things) discussed. One important way in which this can be done is through emphasizing similarities and differences; that is, by grouping similar items together and treating them in the same way. This treatment brings out, at the same time, the similarities within groups of similar items and the differences between groups of different items. The results of such a grouping are shown in Fig. 1. The mixture of items in Fig. 1a may be taken to represent the different items of material that may be included in a technical report, while the material in Fig. 1b has been arranged to bring out the similarities and differences in the items. As a result of the latter grouping, several relationships become instantly clear: the differences between the groups, the similarities within the groups, the fact that each group has the same number of items, and the fact that the number of items in each group is the same as the total number of groups. (Quantitatively, the clarity of presentation is also enhanced by the grouping; the number of groups, the number of items in each group, and the total number of items can be grasped very quickly, in contrast to the time and effort required to obtain this information from Fig. 1a.)

The Pattern of the Outline

Those of us who work with technical reports are familiar with the outline pattern made up by the more or less standard parts of a report; the abstract; the introduction and the rest of the report body itself, with its internal headings; the sections on references and nomenclature; the appendixes; and so on. There may be parts of a report, however, or even entire reports, that do not fall into the standard pattern of headings, for one reason or another. We may receive a report in which the headings have all been given the same level of importance; does this pattern really conform to the meanings represented? Or we may receive a report with no internal headings at

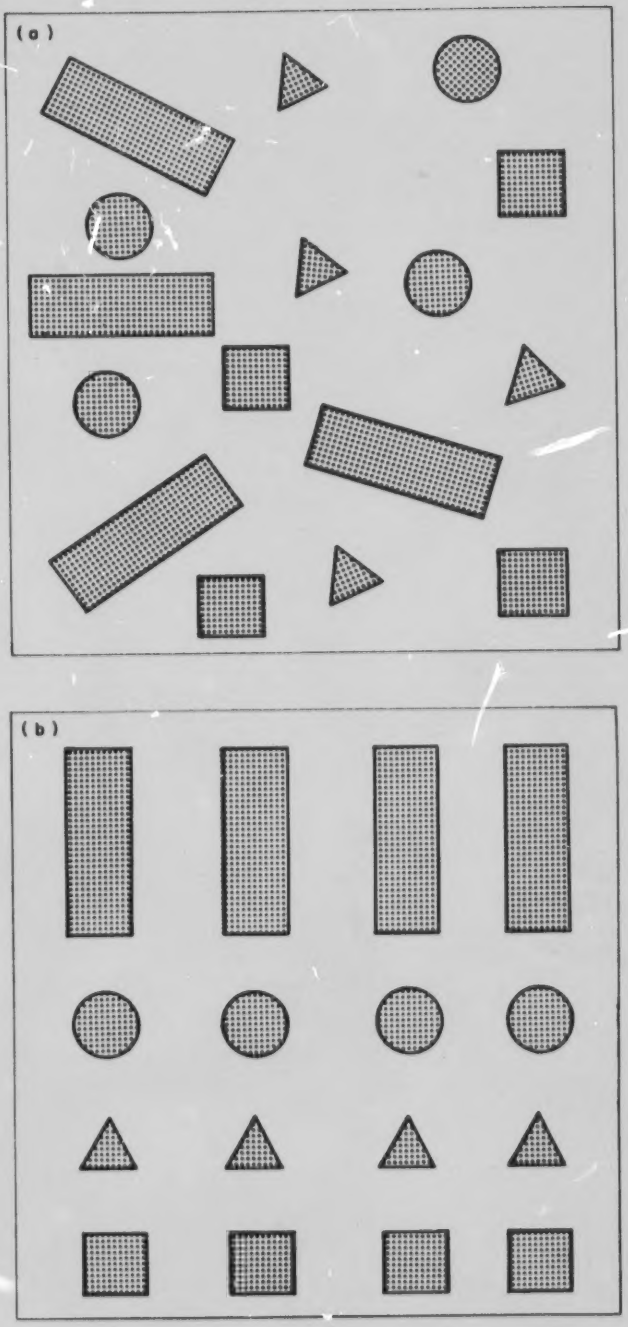

Fig. 1. A pattern formed by grouping items to show relationships

all, or one in which the pattern of headings seems clearly at variance with that of the text. When these things happen, we need a different outline pattern—one that can tell us the relationships that must be brought out in the outline form.

One such pattern is shown in Fig. 2. Again, the significant relationships are those of similarities and differences. In the main heading, all the items to be discussed in the section are grouped together and are considered on the basis of their similarity; in this case, on the basis of their rectangular shape. In the first subheading, the rectangles are considered individually, on the basis of their differences; that is, the different contents of each. In the second subheading, the different items in a single rectangle are considered individually; that is, on the basis of their different shapes.

Thus we can see that each heading must encompass all the items to be discussed in the subheadings below it, but must not contain any item that is not so included. Further, we can see that each subheading can contain only a part of the items that were encompassed in the next higher heading.

The Four Types of Technical Report Information

Regardless of the headings used in a technical report, the information that is normally required may be divided into four types, as follows:

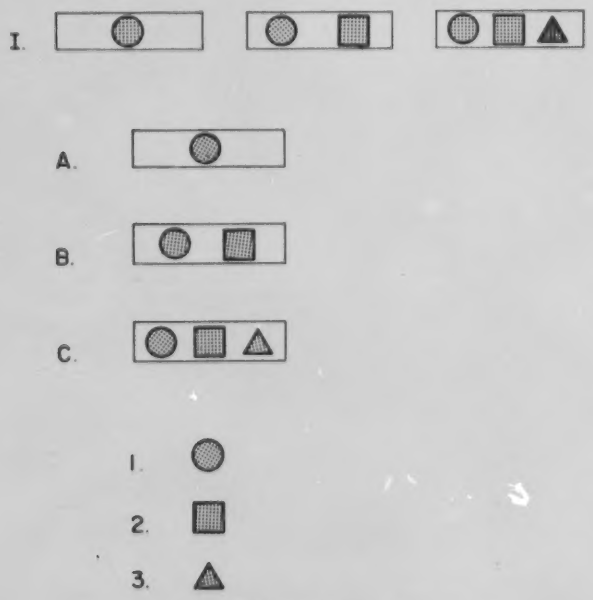

Fig. 2. The pattern of the outline

1. Introductory information, in which the author tells the reader what he set out to do in the investigation he is reporting; that is, the purpose and scope of the study.
2. Background information, in which the author tells the reader about results obtained by previous investigators or gives other information needed to bring the reader up to the point at which the author's investigation began.
3. Information on the investigation itself, including materials, methods, test procedures, and results.
4. Judgments based on the results obtained; these may take the form of discussion, conclusions, and perhaps recommendations.

Each type of information must be given to the reader at the time that he needs it in order to understand what follows. The reader must also know exactly which type of information he is reading at all times. In particular, he must know the exact source of any statement mentioned; that is, whether it resulted from the currently reported investigation or from work by a previous investigator, in which case the information must be documented by an appropriate reference.

The Four Elements of Discourse

It may be helpful for the editor to consider the four elements of discourse—description, narration, exposition, and argumentation—in reviewing a manuscript for clarity. As the elements are applied in technical writing, we might say that description tells what an item looks like, narration tells how it was made or how it was tested, exposition tells how it works, and argumentation tells why it works better than another item. An awareness of these elements may help in diagnosing some common problems in technical writing.

Obviously, the elements overlap. The combination of elements, however, should be as smooth and unobtrusive as possible. One combination in particular, that of narration and exposition, is responsible for many tricky problems of verb tense and point of view, since narration normally uses the past tense and exposition uses the present tense. Thus when the editor finds a passage in which the verbs shift back and forth uncomfortably between the past and the present, it may be an undigested mixture of narration and exposition.

This problem, which is very common, is a natural result of the author's need to tell what happened (narration, past tense) and why it happened (frequently exposition, present

tense). Sometimes these two elements must be combined in a single sentence, as in the excellent example (8, p. 155), "The balloon rose because hydrogen is less dense than air." in which "The balloon rose" is narration and past tense, while "is less dense than air" is exposition and present tense. Obviously, we cannot say "The balloon rose because hydrogen *was* less dense than air," which would imply that air may now be less dense than hydrogen.

Another kind of problem may turn up in the Conclusions section. Conclusions, being judgments derived from results, are usually presented as exposition, in the present tense, while results, being definite events that occurred at a definite time in the past, should be stated in the past tense. When an editor finds past-tense verbs in a section on Conclusions, it probably means that results are being included. If the results are merely being cited to support the conclusions, this may be perfectly appropriate, but if they are being presented as "conclusions," then rearrangement of the material or retitling of the sections may be desirable.

It is obviously not possible to develop any firm rules on mixtures of narration and exposition, or of the other elements of discourse, since every example is different, but the editor may be able to improve clarity and continuity by trying to group similar material as much as possible. Sometimes an expository sentence or two in a paragraph of narration can be enclosed in parentheses as an explanatory remark, thus unblocking the flow of the narrative.

The Patterns of Tables and Graphs

Tables and graphs, both of which are invaluable devices for presenting technical information clearly and concisely, have a similar pattern, as shown in Fig. 3. Both devices are meant to show values both horizontally and vertically, and thus are able to pinpoint an item of data at the spot where the horizontal and vertical values meet. The horizontal coordinate of the table (the box head) is at the top, and the vertical one (the stub) is at the left; the horizontal coordinate of the graph (the abscissa) is at the bottom, and the vertical one (the ordinate) is at the left (though there may be scales at the top and on the right also).

These patterns make it clear that nothing must be allowed to impede the control exercised over the data by the horizontal and vertical scales. This problem arises most often in tables, particularly when a complicated box head is required. No matter how complicated a box head may be, its statement must always read down—straight to the bottom of the table.

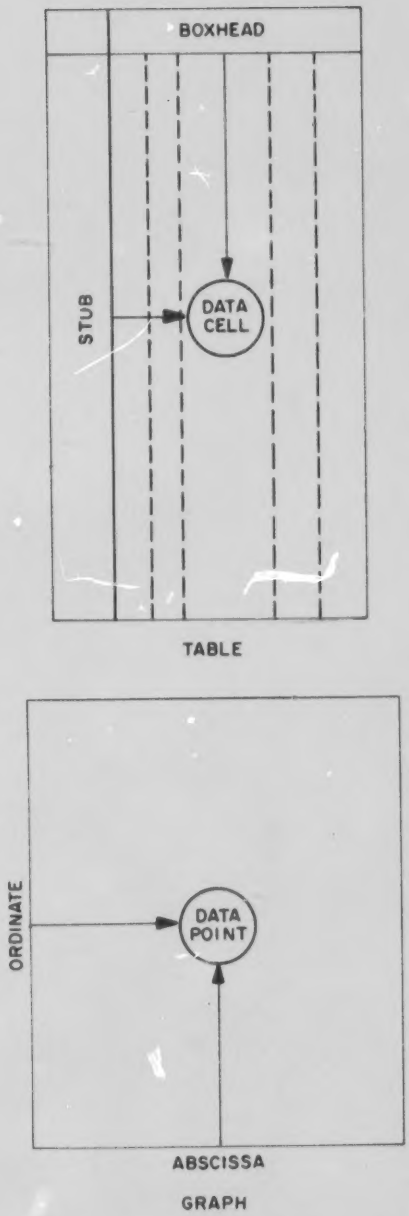

Fig. 3. The patterns of tables and graphs

Because tables and graphs are so concise, it is doubly important that their concise statements be completely clear; there may be no context from which additional meaning can be drawn. Again, emphasizing similarities and differences can be helpful. In graphs, this requires that each different curve, each different type of data point, is clearly indicated as different and is properly identified. In tables, it means that several different headings with almost

the same wording should not be allowed to remain as separate headings; the similar elements should be grouped into a superior heading, if possible, with the differences brought out in smaller subheadings under the superior one.

Reference 5 is a helpful source of guidance on the many problems that may be presented by tables.

The Pattern of Quantitative Statement

The pattern of quantitative statement is that of numbers—definite, concise, and specific. Although the pattern should pervade the entire report, the changes made to achieve it often require work in one small area at a time; the rearrangement of words, phrases, and numerals, sentence by sentence. As the editor tackles these problems, it is helpful if he, too, is as quantitative as possible in his thinking.

It helps to keep count of everything that can be counted. In every sentence, we should know exactly how many things are being discussed, regardless of what the things are; they may be different models, different theories, or simply the different items in an enumeration (which may be the most difficult of all). If, for example, the author is writing about one design but two different models, it is most important that the reader know at every moment whether the design, or one of the models, is being discussed. Items must always be mentioned in a way that clearly corresponds to the number of items that actually existed; in particular, one item must not be referred to in two different places, or in two different ways, as if it were really two.

At this point, the editor may no longer be able to make changes until he confers with the author to obtain more information. In such discussions, the editor should strive to make his own comments as quantitative as possible. Above all, he should not make judgments about the statements involved. For example, the editor should not say "This sentence is terrible. I don't understand it," or "This doesn't make sense," or even "What is the meaning of this?"

Instead, the editor should stick to such factual comments as "How many items are being described here?" or "This term is singular and this term is plural. Do they refer to the same thing?" or "How many separate processes are listed in this enumeration?" or "What is the relationship between these two statements? Is the second the result of the first?"

By thus going straight to the essential questions, the editor can save himself and his author much time and effort, and can more easily obtain the definite information he needs to ensure that a truly quantitative statement is made.

Patterns for Language Changes

The patterns on which the editor makes changes in language may be considered to be, first, the pattern of grammatical structure, and second, the pattern of usage, which may affect not only the appropriateness or acceptability of individual words, but the grammatical pattern as well.

This is indeed a tangled web. Doubtless all of us are aware of the conflicting pronouncements on grammar and usage that have been issued; the proponents of the two points of view have been described as "Advocates of Usage," on one hand, and "Custodians of the Language," on the other (6). When the authorities responsible for determining the patterns disagree so much, what are we, as users of the patterns, to make of it all?

But, particularly because of these differences of opinion, it is important for us as editors to try to set up some guidelines, at least. Without such guidance, we may truly reach the point at which we may no longer be sure what standards are still left that can be defended as reasons for making changes.

That being so, where do we fit into the spectrum of opinion on usage? On one hand, the Evanses, in *A Dictionary of Contemporary American Usage* (2, p. vi), tell us that "Since language changes this much, no one can say how a word 'ought' to be used. The best that anyone can do is to say how it *is* being used, and this is what a grammar should tell us." But Theodore Bernstein, in *The Careful Writer* (1, p. xv), reminds us that "There is no need...for argument about the existence, the inevitability, and the desirability of change. There is need, however, for argument about the existence of such a thing as good English and correct English."

And in *Modern American Usage*, by Follett, Barzun, et al., published in 1966 (3, p. 25) the case is put thus:

> ...despite all its deviations and excrescences, English does have a structure, a logic at its center, a set of principles, a consistency matching that of the orderly mind. Of this structure grammar is the working diagram and teachable plan—reason enough why, to the

worker in prose, grammar remains indispensable.

Probably all—or, at least, most—of us would agree that, for our own needs as workers in prose, the point of view of the latter two references is most appropriate. But if we are to make changes on the basis of such a decision, we must have a more definite justification than that provided by our own opinion or our feeling for the language.

Since technical and scientific reports require a more formal level of usage than many other forms of writing, and since formal English is relatively conservative English, we can choose among the more conservative authorities on usage to obtain guidance. Probably no book will supplant Fowler's *Modern English Usage* (4), but the Follett–Barzun book (3) seems admirably suited to the technical editor's needs in general English usage; the Bernstein book (1) is also helpful, along with the Strunk–White *Elements of Style* (7). Ulman and Gould, in *Technical Reporting Revised* (8) also have a good treatment of usage, with emphasis on problems peculiar to technical writing.

Patterns for Mechanical Changes

In making changes to ensure appropriate usage of abbreviations, capitalization, and similar matters, the editor normally has a more complete and consistent pattern to follow than those we have discussed in the preceding sections. Patterns for mechanical style are usually embodied in a style guide, whether the guide consists of printed rules and suggestions or of a traditional body of knowledge and a special way of doing things. Almost always there is some system of guidance for the editor to follow.

It is important to follow such a guide, and to follow it as consistently as possible. Abbreviations, for example, may be small things in themselves, but if they are used inconsistently, the meaningless differences distract and annoy the reader, or, more seriously, may make him suspect real differences that do not exist.

A style guide also makes possible important savings in time and effort, by removing from the realm of decision many routine choices that might otherwise be resolved in a number of equally justifiable ways. As a result, the editor can devote his major effort to questions of clarity and usage, where his editorial judgment can best be applied.

Conclusions

The basic editorial technique of making changes presents many questions; patterns exist, however, on the basis of which these changes may be made. By attempting to see, and use, the basic patterns underlying technical writing, the editor can make changes that are satisfactory both to himself and to the author he serves.

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From PROCEEDINGS, 1967

The Editor as Generalist as Well as Specialist

Alberta L. Cox

Although it is necessary for an editor to be a specialist (that is, he must know how to edit), he should also be a generalist—to the extent, at least, that he is able to communicate with the people in the other jobs that make up the publishing structure. Broadly, these jobs include composition, illustration, and printing. For the editor to be able to communicate, he should be familiar with production equipment and processes, and he must establish good working relationships with the people responsible for these processes. Many editors, especially technical editors, enter the publishing field as specialists, with little, if any, formal training in publishing techniques. If these editors are to become generalists, they must continue their education on the job.

Introduction

An editor can perform his job happily, secure that his English is impeccable, that his knowledge of science and engineering is as broad as any one human being's can be, and that the amount of tact with which he confronts his authors is enormous—and never falters. I don't think anyone would deny that a successful editor must have these qualities, but this same editor could be even more successful if his knowledge of the mechanics of publishing were complete. He can edit much more efficiently when he knows what is going to happen to a manuscript after it leaves his desk and before it becomes a finished publication.

The concept of an editor as a generalist as well as a specialist[1] may not be new; it is perhaps being lost because of the intricacies of our work. With the requirement (it sometimes appears) that technical editors be scientists who can write well, or English majors with a strong science background, it is hardly surprising that young technical editors are not familiar with publishing procedures. (What is surprising, though, is that there are editors who have been "in the business" a number of years and yet are not familiar with the system either!)

[1] It might be well to clarify terms before going farther. I think perhaps two definitions of "edit" given in *Webster's Third New International Dictionary* may be used. A specialist must be able to "...select, emend, revise, and compile...to make suitable for publication..."; a generalist, in addition, may be expected to "...superintend or direct the publication of...."

I am not criticizing specialization. Certainly, specialists are needed, and as good editors we should know that we can depend on the specialists in the "other" phases of publishing. What I want to emphasize is the way the editor fits into this network of specialists (compositors, illustrators, photographers, printers) and how he can best work with these people.

I don't want to make lengthy recommendations for the formal education of editors; the subject is far from being resolved. The importance of technical competence in science and engineering is obvious; facility with the language is mandatory. A classroom is the best place to learn these subjects, and in a four-year curriculum, not much time can be devoted to "extraneous" material. Sometimes even the English language is slighted in favor of technical subjects.

Where, then, is the editor to be taught the publishing procedures not directly connected with his own function? I think the answer is, "on the job." When a trainee editor enters an organization, he should be made aware of the capabilities and operational scope of its publishing structure, and he should be encouraged to develop his overall knowledge. An experienced editor should show him around, helping him over the first rough spots. Management should be aware of the value of an initial break-in period.

When a young editor learns which publishing steps his company performs, he should try to put himself in the place of each of the people in those steps. What does he need to know as a compositor, photographer, illustrator, or printer to function well as an editor? How can he do his own job so that these people can accomplish their jobs more effectively?

Probably the most important thing the editor should know is how to communicate—and communication can be rather involved. It entails knowing not only (1) what sorts of information must be passed along and (2) what language to use but also (3) how to ask (or demand) that certain things be done so that the one receiving the request feels that he is being told how to accomplish what is needed for the finished result, not how to do his job.

Production Steps

When the editor's work (that is, his work as a specialist) is finished and approved, the manuscript begins to move along the production line, and its first stop is with the compositors.

Composition

Marking manuscript for compositors (and proofreaders) may be something that seems so basic that it need not be discussed. However, consider that unless the editor writes legibly, the people who have to read his markings may be stymied before they can even begin to cope with things that could more logically be called problems. And if the compositor can read the editor's markings, can he distinguish between editorial changes and instructions? A method as simple as that of always circling instructions, or of writing instructions in, say, red pencil and editorial changes in black pencil can expedite this function. An instruction sheet can sometimes be helpful (Fig. 1).

We have all met editors who have a less than first-class relationship with their own typewriters. We wonder, then, whether they know anything about the machines that will be used for the composition of their reports, even such relatively simple machines as variable-space typewriters. To mention just two instances where a knowledge of the capabilities and limitations inherent in composing machines would be of value, consider the composition of mathematics and the composition of tables. In both

TYPICAL INSTRUCTIONS TO COMPOSITORS

1. Commas must not be used in numbers of column 2, table 4.

2. Footnotes are to appear together just before the Bibliography. Use same size type used in body of report.

3. This booklet will be read under darkroom conditions. Use 12-point type throughout.

4. The first section (pp. 1-13) is to be set 3 inches wide for a double-column page. The remainder of the text (pp. 14-76) is to be set 6½ inches wide for a single-column page.

5. Lower case alpha, lower case "a," underscored lower case "a," and italic lower case "a" are all used as symbols. Beware!

6. End periods will be used with figure legends throughout this report. (Reflects policy change; memo to follow.)

TYPICAL INSTRUCTIONS TO ILLUSTRATORS

1. Avoid foldout pages for figures 3-7. We can use reduced lettering for this series.

2. Graphs 13-17 must have the 1/10-inch grid lines. Do not use tick marks. (Pilots expect to see graphs as they appear on plotting boards.)

3. All callouts must be caps and lower case.

4. Do not reduce figure 23. This is a teaching aid to be used for problem solving.

5. Three different views of subject are provided for figure 8. Use the one that best fits your layout.

6. Use artwork furnished by customer. It's not well done, but this is a throwaway--and the project is almost out of money.

Fig. 1. Instruction sheet

examples, the editor should be able to plan ahead to make the copy easier to compose and to decrease the cost of the operation.

Illustration

The manuscript that does not contain illustrations is a rarity. At the same time that the text is being composed, artists and illustrators are making drawings, retouching photographs, and creating layouts.

An editor is not expected to draw, take photographs, or decide exactly where (other than "as soon as possible after mention of") an illustration should fit on a page. But he should be prepared to make decisions about the types of drawings and photographs that are best suited to the document being worked on. Such things as time schedule and cost might very well be the determining factors of whether a complicated engineering drawing should be completely redrawn, should have only the callouts redone, or should be photographically reduced and published as is. Again, clear instructions and proper communication techniques are necessary. The illustrator sometimes needs to know not only what to do, but what *not* to do—and *why* not (see Fig. 1).

A good example of what can happen when instructions are not detailed enough is the following.

I was asked to prepare an instruction book on dimensional tolerancing, a subject of interest to manufacturers, draftsmen, and machinists. The book was to be used in a training class and was then to be retained by the students as a reference. The finished text consisted of 70 pages in loose-leaf form to fit a three-ring binder. There were some 70 illustrations. As often happens, the deadline was completely unrealistic—the class had been scheduled before the text was begun! Happily, production of the first chapters was accomplished in time for the first class.

Some of the drawings provided by the requester were acceptable for use as received (that is, they were black and white line drawings that could be photographed for the offset printing process), but they did not conform to the publisher's style; callouts were Leroy lettering (publisher's style, Vari-Typed), and the arrows had large heads and doglegs (both contrary to style). Minor points? Perhaps. Even though the illustrator used the basic artwork as provided, he changed the callouts and arrows to publisher's style. (Instructions here should have said something like "Use what we get; don't modify to our style.")

Because of the deadline, there was a certain amount of compromise; however, when the popularity of the class called for the schedule to be enlarged and a second printing was needed, more than half of the drawings had to be revised to conform to the style the requester wanted—at a cost of about $500. (Since the book was to be used for a training class, he wanted his students to have textbook illustrations that looked "just like the drawings they would later be working with.")

It would be tempting for me to blame the requester for not pounding the desk and insisting that the drawings be done his way. But the requester didn't realize that there was a style other than the one he was familiar with. I could blame myself for not doing the usual almost-unconscious detective work that editors usually do, but I was trying to meet the deadline (never mind how, just do it). I could blame the illustrator, too. He did take the time to make the changes to conform to publisher's style—but he was concerned about the appearance of the finished product as his boss would see it, and his strong point didn't happen to be blueprint-type illustrating. If more complete explanations had been made, how much simpler it would have been—and how much cheaper, too!

Just as important as drawings or original art, perhaps, is the matter of photographs. We all know how far from ideal are many of the photographs that must be included in some reports, particularly reports dealing with testing, where the subject is photographed to show results that cannot be arranged to make a good photograph, and where, as likely as not, the subject disappears as soon as a photograph is taken—moving on to a scrap heap or to a laboratory.

The editor should know that illustrators can do much to improve a bad photograph. But the illustrator must be told what is important. He might carefully spotlight in a series a missile's approach to a target—when the important thing is the fragmentation effect after the target has been hit. Or, perish the thought (for there are inexperienced illustrators, too), he might retouch a documentary photograph. Remember the line of communication.

There are situations, though, in which the editor can more or less choose what goes into a photograph. He can get a much more meaningful picture in these instances if he gives specific directions to the photographer. In brochure publications, for example, the editor can and should control the situation in scheduling picture-taking and in choosing from the proof copies the exact prints he wants—even to deciding, in some cases, whether the

photographs should be cropped as a part of the finishing process.

Layout

After the text has been composed and the artwork completed, the parts are ready to be pulled together into book or report format. When the material reaches this stage, minute instructions from the editor are usually not necessary. In general, format in this area is fairly strictly ordained by the publisher. The editor can depend on the people doing the layout to conform to the standards, but he must be aware that problems may arise and he may be asked to make decisions and trade-offs.

In some cases, he may want to depart from the established rules; he must have a defensible reason (to satisfy his superiors), and he must give detailed instructions. (He should always put these instructions in writing (see Fig. 1)—and it might help if he were prepared to make a few speeches on the subject when he does bend the rules!)

Printing

When the manuscript has been composed and laid out in page format and has been approved by the editor, it is ready to be printed. I realize that not every company runs its own printshop. But reports must be printed somewhere, and it can be very helpful for the editor to be familiar with printing procedures. This is true not only for planning purposes but at the time the editor approves the proof copy of his report. For example, if the halftone illustrations are muddy, perhaps the original photographs were not of sufficient contrast. Or some pages of text or line vary in heaviness, or blackness. It is helpful to be able to recognize what the reason for the variation is—a ribbon change by a compositor, or the amount of ink on the press. (By the same reasoning, if the editor understands the earlier steps, he might be expecting not-quite-perfect halftone reproductions or uneven pages.)

The Learning Process

Now that we have briefly reviewed some of the more important steps in the publishing process, from editing through printing, let us again think of the editor as a generalist. How can he learn about publishing so that this knowledge enhances his value as a specialist? Where does he begin? How does he proceed?

I think he had best begin with himself. He must understand his own position. He must admit that he does not know certain things. He must study. He must ask questions. He must be willing to follow the material after it leaves his desk (and he must be given the opportunity to do so, at least until he learns the route). When he realizes how much he does not know, he has made a beginning.

One-half hour a day with reference books is invaluable. When the editor finds an undefined term, or when he cannot understand some process being described, he must pursue an explanation—and the best explanations can often be made by the people who are directly concerned with that particular process. He should go to the compositor, to the illustrator, to the printer—they certainly know their equipment. The editor should see this equipment; he should watch it in use. If he sees production work being accomplished, he will understand in what way his own work influences each production operation. He will be less likely to ask for the impossible when he knows the capabilities and the limitations of available equipment and talent.

The editor who expects to have his questions and curiosity welcomed, however, may be in for a rude surprise. Unless his company has established an orientation tour, he may meet with resentment, with the attitude, "why does he have to know this," or, "he's in the way—keep him out." If he has to break his own trails into other departments, he will have to use a lot of tact, making it clear from the beginning that he is there because it will be to everyone's advantage for him to know some (not all) of their problems. When this becomes obvious, I think he will find warm response. So much depends on the cooperation of editor, compositor, illustrator, photographer, and printer that any information the editor may have that will help at any step will be appreciated. Almost automatically, when clear communication lines are established, fewer problems develop.

This is the age of the specialist, but I believe that an editor also must be a generalist in order to do a complete job. How can he maintain good relationships with the other people in the publishing structure unless he knows (and they know he knows) the job? How can he even make valid suggestions? One of the greatest values of being a generalist, I think, is *knowing* that you know the job.

Reading List

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From PROCEEDINGS, 1967

Training the Editor: Skills Are Not Enough

Lola M. Zook

While it is obvious that a trainee technical editor needs to learn editorial skills and techniques, it is less obvious but not less important for the trainee to acquire certain attitudes in and toward his work as an editor. Viewpoints and work patterns that characterize experienced editors are used as a basis for formulating a series of concepts about the key elements in the training of an editorial apprentice. These concepts are discussed in terms of the development, in a tutorial-type on-the-job training environment, of attitudes and viewpoints that will increase the professional capabilities of the trainee. Suggestions are made concerning ways in which senior editorial personnel in supervisory or advisory positions may further the informal training of new technical editors.

When we ask the question, "What must a trainee editor learn?", the obvious first answer is "editorial skills." Certainly, it is true that there are solid technical skills an editor must have if he is to earn the right to the job title. Too often, however, the thinking about what an editor needs to learn—or be taught—not only begins but ends with variations on the idea of skills. When that happens, what we have is not an editor but a mechanic—and it is very likely what we do not even have a very competent mechanic, and certainly not a versatile one.

The development of an amateur worker-with-words into a professional editor who deserves the name includes a number of things quite different from the learning of skills. In essence, perhaps, the process involves learning to know and to understand the context in which these skills will be exercised—that is, a certain way of looking at the work to be done and at the world around it. To a very important degree, becoming an editor involves acquiring certain attitudes and points of view, if the work is to become anything more than the rote exercise of minor techniques. What the trainee editor needs to learn is not only what he is to *do* but what he ought to *be*.

Since editing is a highly personal kind of activity, it is not very meaningful to talk about editorial training in the abstract, without some picture of the characteristics and abilities of the individuals who are to be trained. So let me start by describing some editorial candidates, and then talk in terms of training those people.

First of all, let us assume candidates who are receiving on-the-job training, informal and tutorial in nature as contrasted with formal school or college training in editing. If the training guidelines to be suggested have validity, they may also be applicable to other kinds of

training for potential editors. However, my chief interest lies in the kind of learning that takes place while the trainee is actually at work as an editor.

Let us further assume that our trainees are intelligent, have a college education or something very close to it, and have had some kind of job experience so that they already know the basic facts of life about working for a salary. Let us assume that they have some aptitude for, and interest in, the glories and the pitfalls of the English language; in other words, we are talking about trainees who have the necessary potential for learning editorial skills if they do not already possess them.

The would-be editor might have had college work in journalism or English and some general experience in publications, and wants now to develop as a specialist in the field of technical editing. Or the candidate might be a man who has worked in a scientific discipline and has now been assigned to apply that experience as a technical editor. It might be a woman who has taken college work in a particular science and now finds her best job opportunities in the technical publication field. Or it might be a woman who graduated from college and worked for a few years, then spent a dozen years raising a family; she may have lost touch with her original specialty, but she can now bring maturity and good general background to learning a new specialty as an editor.

Here we have a number of individuals with some relevant similarities and some equally relevant differences in their qualifications—perhaps more differences than similarities. We can assume that the editing jobs to which they are aspiring will likewise have certain similarities and even more differences.

Under these circumstances, what are the things these trainees need to learn? Obviously, in varying degrees depending on their particular backgrounds and the particular jobs they are to do, they need to learn the techniques of the editing craft, and to acquire whatever amount of technical content background is necessary for the kind of editing they will do. But beyond this, what do they all need to learn for their common-denominator title of editor?

Trying to formulate some answers to this question, I started with some general propositions about attitudes and work patterns that characterize an experienced, competent editor. I then worked backward to try to interpret these characteristics, and to translate them into terms of what the apprentice needs to learn.

(1) First of all, *the editor must learn to submerge himself.* His mission is (a) to process and improve material that, ordinarily, has been written by someone else, (b) to serve the needs and purposes of his organization—industrial firm, publisher, military or research agency, or whatever it may be—while he is working with this material, and (c) to manage to do all of this without leaving a recognizable personal imprint on the result.

He must learn that he is now, basically, a bridge between two people—an author and a reader—and that he has responsibilities to both of them. These two people want to bring about a transfer of ideas or information from the first individual to the second, and the editor's place is to help them succeed. Whatever he may do to further this process, his purpose is to ensure that the author's subject matter is communicated to, and understood by, the reader.

If the manuscript is the work of a single author, to be attributed to him, the editor must learn to do his work within the personal writing style of that author. Whatever the editorial changes that may be necessary, they should be indistinguishable in style from the original manuscript. If the author's writing is poor, the editor may have to subtly upgrade the manuscript as a whole, while retaining as much as possible of the author's identity and approach. If the author's writing style is good, the editor must be especially careful not to compromise or degrade that style in suggesting changes necessary for editorial or organizational reasons. In either case, the editor's changes should blend in with the original rather than sticking up in undigested lumps.

The editor's personal writing style, and his likes and dislikes in vocabulary or syntax, must not be substituted for the author's writing style and *his* likes and dislikes in vocabulary and syntax. If the author has an involuted writing style, it does not matter whether the editor likes things short and crisp; it is his job to modify that involuted writing style enough to help the reader, but not enough to lose the author's characteristic way with words.

This is a hazardous area for the editor because he very probably does have strong likes and dislikes on this score; a person who reacts to writing quality in terms of neutrality or disinterest is fairly unlikely to drift into editorial work. The apprentice must build up an awareness of the thin line between things that are the proper activities of an editor and things that are a matter of personal taste. He must learn that "I would like it better another way" does not translate into "It ought to be changed to another way." He must learn to justify every

change he makes, to himself, on a basis other than his own preferences.

If the manuscript has a group or corporate authorship rather than an individual authorship, the editor is still not free to gratify his own tastes in writing. Here he must work to produce the effect on the reader that his organization wants from this piece of work. If the appropriate language is formal and impersonal, for example, the editor must learn to suppress, for this piece of work, any preferences he may have for a more relaxed writing style.

This fact—that he does not "own" the manuscript before him, to do with as he pleases—is perhaps the hardest single lesson for a new editor to learn, especially if he has done much writing himself. Learning this lesson will not guarantee success for an embryonic editor, but *not* learning it will certainly guarantee failure.

(2) Second, the new editor must learn why it is important to acquire and constantly improve the editor's technical skills: It is because *editorial skills are tools to be used to achieve ends*, not merely artifacts from the world of an old-time teacher of grammar.

He needs to learn, for example, that sloppy copy editing on a report is undesirable not because it makes the boss mad but because it detracts from the effectiveness of the product. Careless work on details of the printed page may not seem important but it is very, very conspicuous. It just might make the reader feel that it is the work described in the report that is careless.

Again, suppose the new editor is helping prepare a research questionnaire. He needs to realize that his skill and sensitivity in precise use of language could mean the difference between success and failure in getting the information that is wanted. He is the one who might prevent an expensive round of data collection from turning out to be worthless for analysis purposes, because it later develops that the questions were ambiguous, or the response categories overlapped, or the wording of the questions biased the answers, or the questionnaire used four-syllable words to get answers from people with a two-syllable level of understanding—or, for that matter, used two-syllable words for four-syllable people.

In short, the trainee needs to become aware that the technical editorial skills he is acquiring can be used for achieving direct, specific, practical ends as well as for more esthetic considerations. In the process, he will learn to have more respect for these techniques, and for true craftsmanship in using them.

(3) Third, the new editor needs to realize, very early in his career, that his work is not an end in itself but that *he is one part of a publications system*. The end product of his work is not an edited manuscript but a printed page, and he has responsibilities to and is dependent on other people who will contribute to that end product. He needs to realize that carelessness or ignorance on his part will make the work of other people more difficult and less effective.

He needs to learn about and respect the work of the other specialists in the system—data analysts, illustrators, library researchers, production and printing specialists. He needs to learn about the capabilities and the limitations of the equipment these specialists may use. He needs to be aware of the framework in which the author works, and he certainly needs to know something about the purposes and problems of management. In short, the more he learns about the rest of the system, the more effective he is likely to be in his own job.

Furthermore, the editor who thinks he doesn't need to be concerned with anything except his own immediate work with words is cheating himself. In a practical way, he is lessening his own chances for more varied assignments and for advancement in his chosen field. He is also missing the whole fascinating world of publications technology that is bursting out all around us. He ought to dive in and join the fun!

(4) Fourth, *the editor needs to learn to work, consciously, at many different levels*. The writer—though he will do well to keep in mind the audience he wishes to reach—is primarily concerned with getting onto paper the things that are in his mind. It is the editor who must make sure that the things the author wants to say are said in a way that will reach the reader—the particular readers of that particular item.

In editorial positions where most of the output is addressed to a single category of readers, the editor has the comparatively simple task of defining the level at which he can work effectively for that group. In many positions, however, editors have more varied assignments—a work unit statement or a proposal for R&D processing, a technical report written for military implementation but with a need for communication to scientists in several disciplines, a questionnaire to be used with marginal aptitude subjects, an experimental manual for electronics maintenance, an annotated bibliography on a technical specialty, an organizational newsletter for general information purposes, a professional paper for

publication in a scientific journal, to quote a sampling from the flow of work in my own organization.

In these variable positions the editor must learn to "set the dial" for his own activities. He needs to approach each assignment with the appropriate viewpoint and with a conscious control and selection of the techniques he will use to achieve the particular purposes involved. This is easy enough to say, but learning to do it well will occupy quite a few years out of an editor's life. In any event, the first step for our neophyte editor is to learn that it is possible to use editorial skills with a high degree of purposefulness, flexibility, and control, and that he had best get on with the business of learning how to do it.

This fourth point—that the editor needs to learn to work, consciously, at many different levels—also is applicable in selecting diverse techniques for use in a single assignment. If an electronics manual is to be used by men who are technically proficient but whose reading ability is at the eighth-grade level, that manual is not going to be very useful unless it is prepared with that reading level in mind. The difficulty is that some 12th-grade words and some college-level concepts will have to be used in that manual, reading ability or no. So the problem becomes one of finding means for presenting these terms and concepts in a way that will help the technician learn their meaning and use them. Not only the language skills of the editor but the various resources of format and typography and visual aids should be marshaled to make the manual readable, visually helpful, and easy to use. The editor needs to learn the many things that can be done to help compensate for the unavoidable difficulty of some of the concepts and facts that have to be presented.

(5) Fifth, *the editor must develop a sense of perspective on his own work:* that is, he must learn to control and monitor his performance, suiting it to the time and quality demands of the assignment. A supervisor can give an assignment and establish some guidelines and inquire about progress and be available for consultation. But only the editor working with a manuscript knows precisely what problems and difficulties and obscurities he is encountering. He alone is in a position to weigh comparative values—what problem is important and what is less important, what probably can be remedied and what may be hopeless, when to work out a solution himself and when to go for help.

This kind of self-monitoring ability is acquired most rapidly by the editor whose job assignments have built-in deadlines. He will have a few sad experiences, in which he does the first ten pages beautifully and then, running out of time, rushes through the last 20 pages and thereby misses the worst problem in the manuscript. But an editor under such a schedule soon learns, in self-defense, to get the essential things done first and then spend any remaining time on the luxuries. It may not be a neat system, but it is reasonably efficient.

Developing his own pace-setter is much more difficult for the editor whose assignments are open-ended—that is, the supervisor wants a good-quality job and can allow the editor as much time, within reason, as is needed, to achieve that end. This is the editor who has to make decisions about everything in the manuscript, big and little. Say he is dubious about a certain point but it will take a lot of time to check it, and then it might turn out to be right anyway—should he invest the time? And he is almost certain another point is wrong, but it is minor and he would have to interrupt someone else's work in order to get it checked—is it worth it, or would he be regarded as a nitpicker? The harassed beginner feels he cannot win; he is sure that if he checks extensively the supervisor will think the assignment is taking too long, and if he finishes the manuscript more quickly the supervisor will think too many mistakes were missed. What is too much and what is too little?

Difficult though the process may be, the trainee editor can, with experience, develop the judgment that he needs to pace his own work, to see the various elements of the manuscript in some sort of value relationship, and to decide the relative amounts of time that each problem or activity deserves. He will develop this ability more rapidly if he sets time allocations for different parts of the work, tries to meet them, and then assesses the reasons for slippage. He will soon begin to learn where he is spending too much time debating over trivia, perhaps at the cost of considering less obvious but more important flaws in the manuscript.

One thing the trainee editor should guard against, and that is setting himself the easy goal, that of perfection. Of course such a goal is unattainable—after all, what *is* perfection?—but it is a tempting goal to the beginner because it relieves him of the necessity for making value judgments. He simply does everything that occurs to him, on and on and on. The practical objection to this method is that, eventually, the supervisor is going to lose patience because publication cannot be postponed forever—and the trainee has learned nothing about making manuscript decisions on a realistic basis.

(6) The sixth point that an editor needs to learn was not on the original list I drew up in thinking about this paper. However, I mentioned this project to a group of four editors who have been trainees recently enough so that they still clearly remember some of the more painful moments. I asked them to list, very informally, some things they remembered as helpful or important. As one would expect, the answers varied considerably, but one point emerged in some form on all four lists, usually with exclamation points. It is: *The editor must learn how easy it is to make a mistake!* Quite evidently, they all still bore scars on their self-esteem on this score. Since I bear my own quota of scars, and some of them still pain me, I added this item to my list—with my own exclamation point!

This is indeed the fundamental lesson that every editor must learn, for survival. Furthermore, he must keep on learning it every day of his editorial tenure. It is, in fact, a way of life: Never relax; never assume; don't make an "educated guess"; don't put too much trust in your memory. If something looks shaky, find out; if something looks all right but you feel uneasy, follow your intuition and check it! And, most enduring lesson of all—*always* double-check your own work. Find your own mistakes if you want to cut down on the number of those scars.

(7) And then, finally, after our new editor has gained some experience and acquired some skills and learned some techniques for turning poor prose into better prose, he should begin to learn one more lesson: *Things are not as simple as they may seem.* It is time now for him to take a closer look at some of the things he has accepted uncritically. For example:

- He has learned that redundancy should be avoided and that repetition is bad. Now he should become aware that redundancy, used properly, can sometimes be a way of ensuring that a very important point is not overlooked by the reader, and that repetition, used with skill, can be a means for helping the reader by setting a pattern or providing emphasis.
- He has learned that the active voice is strong and good, and that the passive voice is weak and bad. Now he should learn that, sometimes, using the active voice puts the emphasis on a trivial point in the sentence, while using the passive would give the reader the most important information first and provide a more interesting lead to the sentence.
- He has learned that you shouldn't use a fancy word, like *initiate*, when all you really mean is *begin*. Now he can safely learn that, once in 30 times, an author really means "initiate" and the word should be allowed to stay in the manuscript.
- He has learned that technical jargon is usually to be avoided because it is incomprehensible to the layman, or because it is patronizing or too informal, or because it is just a secret language for the "in"-group, or for some other reason. Now he ought to learn to be more discerning, and that there are kinds and degrees of technical jargon. It *is* the language of the initiate, and some of its terms are a way of communicating a concept in a precise shorthand, so that all members of the group will understand it in exactly the same way. There are times when only use of that technical term will communicate accurately to the people who must be reached. If others are listening, the editor can try to help them by slipping in a simpler translation—perhaps an informal definition phrase in apposition, or a restatement of the concept in lay terms in the next sentence. Also, it is worth remembering that much of the technical jargon of yesterday is part of the working language of today. The editor needs to develop a feel for the kinds of jargon that should not be used, and the kinds that should sometimes be used, and the technical and manuscript circumstances that ought to determine the treatment.

We could all add our favorite examples of things that are not as simple as they seem, and I'm sure we would have some vigorous disagreements among ourselves in the process. The point I want to make is that editing is not just a technique for stating things more simply or more directly or more clearly, although that is often what it does. In skilled hands, editing is something done with sophistication and discrimination and grace. I would like to see our neophyte editor working toward the goal of that kind of editing.

One last word about the experienced editor who is helping to train beginners: Whatever his success with the trainees, the trainer himself will benefit from the process. In trying to teach someone else the principles and the techniques of editing, he is certain to sharpen his own insights and to gain a better understanding of the work and the opportunities of an editor.

From PROCEEDINGS, 1973

Criticism and Creativity

Harold F. Osborne

The editorial function is similar to literary criticism in that it contributes to improvement in the quality of what is written and read. While the editor's function is little known outside the publishing professions, and is infrequently acknowledged as contributory, particularly by writers, it is positive and constructive. Removal of traces of the writer's creative difficulty adds style to the writer's work. Removal of excess wordage adds effectiveness and vigor. Qualities that characterize good writing can be added by an editor if they are not provided by the author. These processes are creative, in that they produce something that was not present previously. The creative satisfactions for editors are akin to those of writers.

When Eugene Ormandy steps from the podium after a performance of the Philadelphia Orchestra the applause is thunderous for a single man—Maestro Ormandy.

The Philadelphia unquestionably has some of the finest professional musicians in the nation filling its chairs. No one of mediocre ability and musicianship is likely to be found on its roster.

But the program notes, the music critics, and the covers on the Philadelphia's recordings pay tribute to Dr. Ormandy and to the orchestra as a single instrument, tuned, controlled and "played" by its conductor—not to the 70 competent and talented individuals who collectively make its music. We accept this custom without question. We do so partly because it is our traditional way of thinking about orchestras and conductors. But it is also obvious that Dr. Ormandy makes a significant contribution in creating the orchestra's final product—beautiful music—without playing a note himself.

Somewhat similarly, a case can be made that editors conduct, manage, inspire and create, as they orchestrate the output of groups of competent writers. Yet only rarely is the editor's role recognized and acknowledged.

There may be a plausible, if cynical, explanation for this. It is, alas, a matter of stern reality that the public hears about editors—if it hears about them at all—only in whatever words writers employ in discussing them. It is revealing that Bartlett's *Familiar Quotations* indexes 139 quotations on writers and writing, only three on editors and editing—and none of the latter deal with the editorial function or with editors as people.

The Function of Criticism

Perhaps a more exact parallel than music can be found in the realm of literary criticism. From the time of Plato to T. S. Eliot in the 20th Century, eminent philosophers, scholars and authors have established their reputations in cultural history in whole or part by literary criticism. Not infrequently, their critical works are now what is principally remembered, although their contemporaries may have esteemed them for their original writing, or for other abilities.

Literary criticism (and book reviewing, its contemporary companion art) are reputable pursuits generally accepted by writers and publishers, and by the public, as contributing positively to the overall quality of what is written and read in our society. Critics make judgments of the quality, the style, the import, the soundness, the significance, the congruity, the completeness, the unity, the relevance and the accuracy of authors' works. These assessments are made after the fact—after the article or poem or textbook has been published.

It is in this context that we approach the topic of "Creative Editing." Our theme is that editors also make judgments as to quality and style and accuracy and relevance and all the rest—and do so *before* the manuscript is published. Theirs is also an occupation that contributes to the end product in a constructive and creative way.

Editorial Compulsions

I offer for consideration the unfamiliar concept that editing is by definition creative, in the sense that it adds something that was not present previously in the manuscript. Those who have learned of the function of an editor only from the lips and pens of writers may regard this as revolutionary, if not ludicrous. Are editors not "hair-splitters," "heavy-handed butchers," "petty tyrants," "frustrated authors"? Does their performance not constantly brand them as "compulsive," "super-perfectionists," "insecure," "sadistic"? Many writers have said so.

For example, H. G. Wells declared: "There is no passion, no love or hate, equal to the passion to change someone else's draft."

And several years ago, Carl M. Johnson of the USNEC, San Diego, speaking on an ITCC panel, said: "A good editor has a heavy hand and a cold heart, low animal cunning, a killer instinct." (Actually, I believe Mr. Johnson meant this to be complimentary.)

Editors wear many hats. The editor's role as diplomat is being discussed by another panel at this conference. His role as manager is sometimes mentioned. There are times when he is coordinator, expediter, traffic cop and grand marshal.

Very often the editor must serve as if he were the Supreme Court, in the sense that his may be the final exercise of responsibility. The buck often stops at the editor's desk when a decision must be made at deadline. The editor then must be wise, learned, experienced, must be unflappable, must have integrity, and must be willing to stick his neck out for the position that seems soundest.

Champions of Good Usage

Another function is that of Defender of the Faith. In guarding against the solecisms, non sequiturs, contradictions and sheer nonsense that sneak into the fallible copy of fallible human writers, the editor holds high the banner of good usage, of literate expression, of well-honed vocabulary, of effective, attention-getting writing.

I would like to return, however, to the editor's role as critic. An editor, in processing a particular piece of copy, and in his career of applying judgment to others' writing, continuously performs the same positive function that a literary critic does. The editor, however, makes his social contribution before the work is published.

Writing is a difficult art, at best. Writers themselves are the best witnesses to their craft, and in their testimony the word "difficult" appears often.

Thomas Mann said "A writer is someone for whom writing is more difficult than it is for others."

Anthony Trollope maintained "There is no way of writing well and also of writing easily."

Joubert, speaking on the creative process in writing, said: "To finish and complete your thought!—how long it takes, how rare it is, what an immense delight!..."

Stevenson's view was that "The difficulty of literature is not to write, but to write what you mean; not to affect your reader, but to affect him precisely as you wish."

And Lord Dunsany commented "When you can with difficulty say anything clearly, simply and emphatically, then, *provided the difficulty is not apparent to the reader*, that is style. When you can do that easily, it is genius."

Deletions Add Style

Perhaps a genius needs no editor. But, in the testimony of the writing fraternity, most writers do, because the difficulty they have encountered in capturing their fleeting thought remains all too apparent to the reader. And it is the editor's task among others, to remove all evidence of that creative travail.

Therefore Lord Dunsany would agree that an editor who removes such literary bloodstains adds style, and thereby contributes a previously nonexistent quality to the manuscript.

An editor who completes a thought which had persistently eluded an author also adds something. He adds the thought. Moreover, for the editor, the act of completion is as genuine a delight as it would have been for the writer. His inner tension has been relieved, as surely as the author's. And M. Joubert would agree the editor has been creative.

We are still talking about what editors *add* to a manuscript. This is positive action, not nitpicking.

In the introduction to *The Elements of Style*, William Strunk, Jr., is quoted by E. B. White as follows:

> Vigorous writing is concise. A sentence should contain no unnecessary words, a paragraph no unnecessary sentences, for the same reason that a drawing should have no unnecessary lines and a machine no unnecessary parts. This requires not that the writer make all his sentences short, or that he avoid all detail and treat his subjects only in outline, but that every word tell.

Words, Words, Words

Wordiness is the hallmark of much too much writing. Too much detail is given—writers tell us how to build a clock when all we really care is what time it is. They are afraid we have missed their main point (perhaps because it was poorly stated!), so they repeat it in different words, diluting the thrust and confusing the reader into thinking this must be a *new* point—or putting him to sleep.

Almost every writer, because writing is difficult for him, because he is wrapped up in his work and has something important that needs saying, tends to over-write. Almost any prose passage, as a consequence, can be cut 10 to 15 percent without loss of meaning. Many can be cut one-third or more. And the man or woman who does the cutting makes a contribution: An editor who removes wordiness adds conciseness, pointedness, impact.

Similarly, an editor who removes dangling participles adds good rhetoric. When he improves grammar, punctuation or spelling, he adds correctness and accuracy, at a minimum, and probably effectiveness too.

Effectiveness results from mastery of such principles as unity, subordination, exactness of diction, euphony, coordination of thought, economy, balance, parallelism, variety, emphasis, suspense and climax. And each of these qualities may be potentiated by an editor. Often the writer's true vigor is revealed merely by pruning of excessive length and homogenizing the obfuscatory verbiage. The editor's negative action brings positive improvement. The editor has created qualities that were missing before.

Marks of Quality

A manuscript that is well edited will get positive answers to the following questions:

"Is the presentation attractive?"

"Does it invite readership?"

"Does it convey the desired impression or message?"

"Are sections or chapters logically divided?"

"Is the subject matter treated in sufficient detail?"

"Are definite conclusions set forth?"

"Does the terseness of the exposition hold the reader's interest?"

"Are there imaginative comparisons and contrasts?"

"Is there good balance of different sorts of material?"

Certainly good writers can provide copy that gives "yes" answers when all those questions are asked. Certainly many writers do not do so consistently. And if the writer does not, these are points—among many others—on which an editor can concentrate his skill.

In so doing, he creates effectiveness. He may even create a report, a speech, or some other document, where only a jumble of ill-phrased thoughts existed before.

Someone has described an editorial office as a place where the ept opt for the apt. As they do so, the ept cannot fail to be creative.

From PROCEEDINGS, 1974

A Logical Approach to Editing Proposals, Reports, and Manuals

David Edward Vaughn

Proposal, report, and manuals editing will be an enriching experience if the editor can be inspired to take a positive approach. The author introduces the reader to his philosophical point of view on various aspects of editing. The paper reveals no new ways to edit, but it does offer what the author feels is sound logic in dealing with existing problems and methods. It places particular emphasis on editorial speed versus document accuracy and quality and deals with establishing an accuracy/quality optimum. The paper concludes with an in-depth look at manuals preparation.

Technical editing, like any occupation, is whatever we choose to make it. For those who prefer to stand still in the work, it can become drudgery. For those who will move forward, it can be an enlightening and personally enriching experience. It is to the latter group that I dedicate this paper.

In our quest to find better ways, we so often turn our attention toward devices, machines—things. In exploring "a logical approach," I find it essential to look first to the inner self. I believe that we must determine certain things about ourselves before we can successfully move off in any direction.

A Philosophy

Today, every technical editor faces increasing pressure to produce more work, of better quality, in less time. How we, as individual editors, react to these pressures depends largely on our attitude toward the work. The grossly inefficient may fall by the wayside; the defeatist may cry, "It can't be done"; and the slow, meticulous person may or may not accept speed improvement. But the editor who is already turning out good work at a rapid pace is probably the most vulnerable of all to the increased stresses that accompany increased demands. This editor has a choice: (1) become discouraged and join the defeatists or (2) accept the challenge and go forward. This paper addresses those who choose the latter.

The theme, "a logical approach," offers a three-part theory:

1. Proper mental attitude toward the work—for without this, there is nothing

2. The use of logic as a tool in approaching every editing task and in coping with every editing problem
3. The art of balancing editing speed against document accuracy and quality.

Changing Our Attitudes

Developing a positive attitude can be a revelation, especially if we accepted increased work and time pressures simply as a price we had to pay to keep our jobs. Each of us can have a positive attitude if we are willing to impose some self-discipline.

Perhaps the first step in making the change is a willingness to exchange the idea of being punished for that of being challenged. What we may have considered an unfair burden, we can think of as a challenge. Once the conversion has been made, its sustenance depends on the order, control, and logical progression of our own thoughts in relation to the work. Its potential reinforcement lies in a profound sense of satisfaction. The only prerequisites are the desire and the ability to work in a self-imposed, ordered environment.

Changing attitudes should include cultivating a good relationship with our colleagues. Vocation encouragement, information sharing, mutual respect and understanding, and a conspicuous absence of disparagement are all signs of healthy work attitudes.

It's important that we know our authors. We need to find out what they hope to accomplish and then do our best to help them. Many authors look to editors for help in validating their manuscript; for research to obtain missing information; and for advice about trademarks, copyrights, or proprietary restrictions. Whatever the case, we should fill these needs to the best of our ability and provide our authors with the most accurate information we can obtain.

The editor's fair contribution to the author–editor working relationship is 50 percent; isn't it logical then to go beyond the halfway point to assure a sound and congenial relationship? This extra effort from the editor can often convert a lukewarm author to a very enthusiastic one who, in turn, can make technical editing a source of pleasure. The resulting intellectual and emotional climate can also be highly conducive to the production of a superior technical publication.

Logic as a Tool

There are several dictionary definitions for "logic." One that seems particularly appropriate describes logic as an interrelation or sequence of facts or events seen as inevitable or predictable. This suggests

- Order—The sensible arrangement and procession of facts
- Interdependence—Making all the pieces of the editorial puzzle equal the whole by proving their relationship to each other
- Consequentiality—The anticipated, inescapable results of the editor's work as a basis for every editorial decision.

Order is vital to the editing process. Experience teaches us that chaos reigns when a manuscript is not handled systematically. Whatever system we use, it must treat the editing process in a logical sequence, and it must be tested, proven, and followed.

A publications team, of which the author and editor are part, might be likened to a baseball team: whoever holds the ball is responsible for what he does with it until he throws it to the other fellow, who then becomes responsible. Similarly, author and editor have a common purpose; but again, like ballplayers, each plays his respective position differently. The author, in his rush, may have pasted together disconnected paragraphs, often taken from separate documents, with the hope of filling the needs of a particular subject. The editor is then faced with making the pieces fit together logically and supplying the needed transitional material.

In still another analogy, the editor might be likened to a carpenter. The care with which the carpenter works, as well as the quality of the materials he uses, affects both the strength and beauty of the result. Decisions made during the construction process are based on predictable results. The editor also faces this inevitableness. Every editorial decision must be based on the realization and anticipation of the outcome.

The use of logic also involves the powers of deductive and inductive reasoning. A good command of these powers equips the editor well for the role of problem-solver. The need for deductive reasoning, reasoning from the general to the particular, evidences itself in the editorial preparation of proposals and reports. Inductive reasoning, reasoning from the particular to the general, seems to figure more prominently in the editing of handbooks and manuals. Often, our thinking oscillates between the two kinds of reasoning, making them interactive.

The logical processes require plenty of concentration, a luxury hard to come by in a busy editorial department, but

vitally important in preparing a high-quality document. The editor often has to struggle to maintain continuity, but the effort pays off in a better publication, finished in less time. Continuity of work, intensity of thought, and keenness of interest rank high in the single-mindedness continuum.

The Balancing Act

Given a piece of marble, some tools, and a vision, the sculptor creates a statue. Given a manuscript, a few hours, and a handful of pencils, the editor creates a document. We're not sure whether the sculptor has a deadline, but we know the editor does.

The editor must indeed learn to perform a balancing act: to balance editing speed against accuracy and quality. This ability is refined through skill development and an almost inherent sense of spending just the right amount of time on the right parts of a manuscript. It does, in fact, become a separate skill within itself, one that grows through trial and error, through failure and success. It represents one of the most pressing problems confronting today's technical editor. For this reason, I have devoted the following section of the paper to this subject.

Speed Versus Accuracy and Quality

Editing speed as a function of document accuracy and quality usually represents a compromise, with pressure of deadline and quantity of work as the major determinants. Since publication turnaround time and accuracy/quality are indirectly proportional (that is, generally, the less time we have to work on a document, the poorer its accuracy and quality), it seems more logical to strive for optimum accuracy and quality than it does to expect perfection or, worse, become resigned to mediocrity. This compromise is more typical of proposals and certain reports than it is of manuals.

At this point, I want to qualify four terms used in this discussion:

- *Speed* is the rate at which editing is accomplished.
- *Accuracy* is the careful conveyance and enhancement of the author's technical truthfulness.
- *Quality* is the visible product of editorial skill in organizing the material, preparing the format, and attending to all the elements of grammar, aesthetics, and cosmetics.
- *Optimum* is that grand compromise somewhere between perfection and whatever we can squeeze out of the time available to do the work, but not to exceed the quality level specified for a particular document.

When we have a large manuscript to be edited in a relatively short time, we automatically place the timely completion of the work as our prime objective. This is a natural and necessary reaction. But, as soon as this happens, document accuracy and quality become secondary. And, unless we are particularly oriented toward producing accurate documents of good quality, these attributes will become even farther removed from the prime objective. Bringing these attributes as close as possible to the prime objective (the timely completion of work), without altering that objective, becomes the focal point for the accuracy and quality I call "optimum."

To achieve this optimum, we need to apply our editorial resources and talents to solving problems and circumventing roadblocks that show up as

- Fixed elements:
  - Quantity of work (equivalent manuscript pages divided by the editors available)
  - Scheduled editing time
- Variable elements: All other factors that determine the difficulty or ease of the editing task.

To assess the importance of these, let's examine the two groups independently.

By the time a proposal or report reaches the technical editor, its volume and schedule can usually be determined. In addition to counting pages of text, we can convert tabular material and artwork to some sort of manuscript page equivalent, thus establishing the total workload. This may be considered fixed, but the work can be broken into smaller pieces by dividing it among several editors. Scheduled editing time, on the other hand, is definitely rigid. Even though the work may be distributed, the pieces must be worked concurrently.

In addition to these fixed elements, many variable factors determine the difficulty (or ease) of the editing tasks; some are predictable, some are unpredictable, and others are continually changing. Some are within the editor's control and others are not. Here they are as I see them; perhaps you can add some of your own:

- Completeness and accuracy of the author's (or his coordinator's) definition of the relevant points of the request for proposal (RFP) or contract
- Given these points, the editor's emotional response, his degree of acceptance, and his enthusiasm to

anticipate and project the work and its companion responsibilities

- Editor's general emotional and physical state
- Editor's competence/skill-level and developed work speed
- Performance of the proposal or contract organization's liaison
- Agreement on proposal/report format
- Completeness and accuracy of the outline
- Timeliness of manuscript delivery to editor
- Quality of manuscript
- Complexity of format
- Availability of photographs, boilerplate, and other material
- Technical complexity of the manuscript
- Editor–author, editor–peer, and editor–supervisor working relationship
- Editor's emotional response to pressure as the deadline approaches
- Editor's motivation to see the job through with all its details.

As editors, we live with the deadline. A late proposal is the same as no proposal; and a late report may violate a contract. Knowing and appreciating the elements that compose our editing problems and obstacles is the first step in moving our accuracy/quality optimum toward companionship with the timely completion of the work.

Maintaining Speed While Safeguarding Quality

Editing time should be carefully budgeted, and that budget jealously protected. Once established, editing time must be used to the best advantage. Anything we can do to speed editing will release more time for quality—and that time should be spent on quality. Turning the manuscript over to the composition room several hours ahead of schedule is a poor substitute for superior editing. There are several ways to assure adequate editing speed and at the same time enjoy some built-in safeguards for quality. To achieve these, I believe we should

- Learn as much as possible about the contract requirements, RFP, or other governing documents. It's easier to discard unneeded information than to be kept in the dark until the job is nearly finished.
- Encourage proposal and report writers to thoroughly review every manuscript and have it retyped, double-spaced, before sending it to the technical editing staff.
- Encourage proposal groups to hold all their own and consultants' reviews before the technical editor starts his work.
- Encourage storyboarding. Storyboard proposals are much easier to edit because they are necessarily less verbose and generally do a better job of conveying the message.
- Develop a minimum number of standard formats and stick with them. Stress simplicity and economy, and allow enough flexibility to meet most RFP and contract requirements. Reach a "very early" agreement on format for every job.
- Plan as far ahead as possible, and hold briefings with other editors so that when the work is received it can be distributed immediately. There's nothing more wasteful in technical publications work than holding a job for 2 hours while trying to decide what to do with it.
- Use our editorial resources wisely. Editing chores should be assigned by matching available skills to the work.
- Do the most important tasks first to be sure they get done.
- For additional quality, do an editing review concurrently with the author's review.
- Always final check the document before it goes to print. This is probably the most neglected step in the whole editing process, yet it is the final document validation.
- Practice professionalism—always.

Establishing and Comparing an Optimum

Experience and logic teach us to pace ourselves to complete our work on time. By doing this, and planning a little leftover time as a reserve, each of us can establish our own optimum on a given piece of work.

Given a projected editing time in hours, a fixed workload in adjusted manuscript pages, and a particular set of conditions (variable elements), I believe that each editor can establish a predictable level of document accuracy and quality. This level will, of course, vary from job to job and from one set of conditions to another. Just as each editor has his or her own system of editing, so will each editor develop a predictable level of competence relative to the pressures of the workload. The higher the level of competence, the more favorable the optimum.

The following illustration has been devised to give an arbitrary, quantitative rating system which compares a selected optimum with other levels of accuracy/quality ranging from inferior to superior. The ratings are achieved by plotting quantity of work (adjusted manuscript pages) against time (projected editing hours for one editor). For this discussion, 50 pages edited in 8 hours by one editor has been arbitrarily chosen as the optimum combination.

Note that we are not ignoring the all-important variable elements mentioned earlier, but these are too nebulous to be used in the calculations. The illustration is, therefore, based on a fixed set of variables.

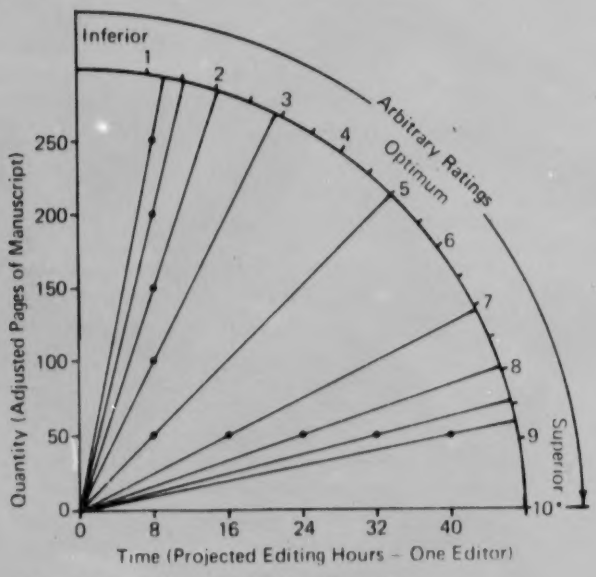
In Fig. 1, the spectrum is divided into ten equal parts. The ratings read clockwise beginning with 1, Inferior; and ending with 10, Superior; with Optimum in the center at 5.

In using the illustration, the first step is to select an optimum combination of quantity (pages) and editing time. This can be anything you think is reasonable, based on your experience and the job at hand. The selected combination of 50 pages and 8 hours represents a reasonable day's work for one editor, assuming a difficult manuscript.* For comparison, I used a range of 0 to 250 pages and 0 to 40 hours. (Remember, this exercise is not intended to calculate the optimum, but to compare a selected optimum with other probable combinations of quantity and time.)

The quantity/time optimum combination is placed on the graph so that a straight line drawn from the origin (0,0) to the 5-rating (Optimum) passes through the locus of the chosen coordinates. Other ratings are achieved by drawing lines from the origin through the desired quantity/time loci. Note that you can substitute any combination of numbers and ratings for those in the illustration as long as you maintain proportions and relationships. Figure 2 lists the comparative information derived from the selected combinations and their arbitrary ratings.

Each entry in the figure represents a separate plot in the spectrum. The first step is to record pages and hours as they were plotted. Pages per hour may then be calculated to help us pace ourselves to the work. Next, we read the plots to determine the accuracy/quality ratings. From these ratings, we can determine the improvement differentials and the percentage of improvement of each rating over the preceding rating.

The heavily boxed areas hold the key information. The horizontal box holds the optimum readings. Note that this group shows a 72 percent improvement over the group that precedes it, more than 30 percent better than the nearest competitor. The vertical boxes give a running account of the ratings and the percentages of improve-



*Theoretical maximum quality – unlimited time available – not a realizable condition

Fig. 1. Quantity and time as functions of document accuracy and quality

*This estimate is based on a rapid throughput and a cursory type of edit.

	Manuscript Pages	Projected Hours	Pages per Hour	Accuracy/ Quality Rating	Rating Improvement Differential	% Improvement over Previous Rating
Time Constant; Pages Decreasing	250	8	31.25	1.25	-	-
	200	8	25.00	1.55	0.30	24.00
	150	8	18.75	2.05	0.50	32.26
	100	8	12.50	2.90	0.85	41.46
	50	8	6.25	5.00	2.10	72.41
Pages Constant; Time Increasing	50	8	6.25	5.00	-	-
	50	16	3.13	7.10	2.10	42.00
	50	24	2.08	7.95	0.85	11.97
	50	32	1.59	8.45	0.50	6.29
	50	40	1.25	8.75	0.30	3.55

Fig. 2. Comparison between an accuracy/quality optimum and other probable combinations of quantity and time

ment. Note that the superior quality ratings do not achieve impressive percentages of improvement when compared with our selected optimum combination. In other words, we are seeing another manifestation of the law of diminishing returns.

Obviously, we are not going to go through all of these calculations each time we do a proposal or report, but I believe the illustrations do show us the value of examining our manuscripts sufficiently to determine an optimum combination. Then, we can pace ourselves to do the work and try to incorporate as many accuracy/quality safeguards as the schedule will permit.

Manuals Preparation

The professional manuals-writer generally edits most of his or her own work, but the occasional manuals-writer—the engineer-author, for example—usually needs editorial help. The occasional writer may never have written a manual before, or has written very few, and is often poorly versed in the details of publication. This is the author with whom we are concerned.

A manual should be tutorial and should serve as a repository of information. It should be the kind of publication that a reader will like well enough to turn to again and again. If it is a machine or user's manual, it should be designed for durability; thus time and money should not be invested in fancy binders, elaborate formats, or sophisticated artwork. Strong covers, strong binding, and reinforced pages are wiser choices. The writing and editing should be straightforward and easy to read, with the objective of giving the reader the complete message at minimum publication cost.

A general-purpose manual, on the other hand, must be a book that the reader will want to keep on his desk for quick reference. It should be attractive, conveniently arranged, and easy to use; a book that the reader will enjoy using, be proud to have, and want others to use. The sophistication of format and visual treatment will, of course, be determined by the author's budget.

Some manuals may overlap these categories and require some of both kinds of treatment: some types of training manuals, for example. Once the category has been established, we will need to ask questions like these:

- What is the scope of the book?
- Who will use it?
- What kind of work environment will it be used in?
- How much material will it contain?
- Will it be updated from time to time?
- How long will its useful life be?
- How much of the book will be done initially? How much will be done later, and when?
- What is the publication schedule?
- How much money is budgeted?
- What is the contingency plan for schedule upset and expanded scope?
- What are the editorial research requirements?

After these questions have been answered, we can make final decisions about the visual and physical aspects of the manual.

Now is the time to turn to the outline—a vital, early step in the production of any manual. Regardless of the condition or completeness of the manuscript, the written material should be tested against the outline; and the outline, in turn, tested against the author's oral version of the manual's purpose and scope. It's surprising how often these do not coincide.

Often, it is necessary to go back and rework the outline. Even the title may need to be changed. In worst-case situations, it may be necessary for us to set the old outline aside, use it only as a topic reference, and take the following measures:

- Develop a thematic title. This will be a general expression of the theme and will set the tone for the entire book. It can be refined later to get the actual book title.
- Choose the major topics the author wishes to include within the general theme, giving them a brief title, and arranging them in a logical order. (The old outline may be of some value here.) Some topics may be deleted and some added later, depending on how well prepared the author was when he began working with us.
- Develop the major topics. With the author's help, write a thesis sentence for each topic.
- Expand the topics. Again, with the author's help, write at least a paragraph as an expansion of the thesis sentence.
- Choose subordinate topics as far as possible at this time, giving them a brief title, arranging them in logical order, and expanding them in any way we can.

- Analyze the outline. Does it serve the thematic title in the following respects?
  - Will its material answer the questions posed by the average prospective reader?
  - Does it seem complete?
  - Is it logical and relevant?
  - Is the sequence good?
- Repair the outline. If our analysis shows some weak points in the outline, we should make the repairs as soon as possible.

Again, the outline is vital. If we labor over it, it will serve us well. Time wisely spent on the outline now will save many times this effort later on, and we will have a much better manual as a result.

By now, the author probably will have turned over to us all the material he has collected for the book; and we can lay it out to fill the topics planned in the outline. We should give the material a cursory review to determine what we have and what we need. We should list the deficiencies and give this list to the author. He can then go to work to write or otherwise provide the missing items. If additional research will be needed, now is the time to decide who is going to do it. If we are elected, we should plan for the necessary interviews, photographs, and other items.

Let's read all the material again—this time slowly and critically. Analyze the content. If it needs some reorganizing and rewriting, consult with the author. If he agrees, do it. If we need technical help, we should call him. If he is interested in the success of his manual, he will give us his undivided attention.

The technical edit of a manual usually represents the re-creation of a manuscript and affords an opportunity for creative editing. Spending some extra time on the editing process is an excellent way to hold down composition costs on both the initial preparation and the change or correction cycles. To achieve this, it's important that we provide the production people with a neat, carefully marked manuscript that contains concise, but easy-to-follow instructions for all phases of the composition work. Careful editing also helps achieve greater technical accuracy and shortens production schedules.

After the editing is done, we can concentrate on planning quality control steps, assuring that everyone concerned knows about schedule and budget constraints, and caring for the miscellaneous things like ordering binders, tabs, or special paper for printing.

When the composition work is done and the review copies are ready, we should do an editor's review of the document concurrently with the author's review. This will help us check our editing for mistakes and will serve as an additional proofing operation for the composition work. Also, it's an ideal time to do a second edit, if needed. Our findings and changes should be revealed to the author and correlated with his changes.

When all the changes and corrections have been made, let's give the document a thorough final check. If the changes were heavy, the manual should be double-proofed: once by the proofreader and once by the editor. It is not difficult to justify a thorough final-check operation if we take a moment to think about the time, labor, skill, and creativity already invested in the document.

The authors of most manuals have been selected for the job because they have something special to contribute to their particular field of work. As a natural consequence, they are usually both interesting and enthusiastic; working with them makes manuals editing a pleasant and satisfying experience.

Conclusions

Our attitude toward our work is of major importance to our own success as a technical editor, and to the success of each document on which we work. If we are determined to achieve excellence in those things over which we have some measure of control, then I believe we will achieve that excellence.

Pacing ourselves to the work is important to its timely completion, but it is also important in helping us allocate enough time to implement adequate quality control. Striving for the optimum in document accuracy and quality is a respectable goal in technical publications. When that optimum turns out to be just the very best we can do in the time alloted to do it, then it becomes the only "logical approach."

Unscheduled, rush proposals can turn out well too. Sometimes these seem like impossible tasks, especially when their quick turnaround is compounded by a shortage of editorial manpower. But experience has proven that many editors perform extremely well under the pressure of a surprise, rush job. Some quick planning; cooperation among all parties concerned; fast, astute editing; and the right balance between supervision/control and editorial freedom produce amazing results.

We should build reader appeal into every document. Every published work is someone's effort to sell an idea, a philosophy, or a product. We practice good salesmanship when we use the proper techniques to hold reader attention. This is especially true in high-use documents such as manuals.

Probably the most important single step in manuals preparation is the outline. Time well spent on the outline can produce substantial savings later on in the work and result in a much more complete manual. The final-check operation also deserves special attention. This is the last step in document validation and the point at which we "lock in" all the time, labor, skill, and creativity invested in the book.

Technical editing can be a real learning experience. We are continually exposed to new technologies and new work situations. By learning a little about each subject, we broaden our experience base and, in turn, diversify our editing skills. But becoming a better technical editor is much more than a self-serving goal. It is a genuine opportunity to help our authors communicate more effectively with their readers. In doing this, perhaps we will have found our place in "the expanding horizons of technical communication."

From PROCEEDINGS, 1971

Taking the Noise Out of Technical Writing

John W. McDonald

In any communication system, the accuracy and intelligibility of the message is limited by noise. Noise enters written communication as "linguistic noise" (misfit words, confused syntax, and faulty organization) and "typographic noise" (printing errors, poor graphic design, and faulty reproduction). The concepts of noise filters, modulation, and signal-to-noise ratio are applied to technical writing in terms of careful writing, editorial monitoring, and relevance of the message to a particular audience.

Introduction

Noise has recently become a topic of great interest. Unwanted and excessive noise pervades our society, with effects ranging from the distractive to the destructive. Legislative bodies have responded to public awareness of the detrimental effects of noise by imposing standards for industry, construction, and transport. One wonders whether the sonic boom of the SST will ever be as loud and disturbing as the political noise it has already generated.

All communication, with the possible exception of divine revelation, takes place in the presence of noise. In all person-to-person communication, we must rely on our truly remarkable ability to detect useful signals in an environment of ubiquitous noise. And hope that we don't make matters worse by irritable reaction to the task of sorting out what is useful in a badly constructed message that is garbled in transmission, distorted by the carrier or medium, and filtered through our own sieve of preconceptions and prejudices.

Before we talk about how to reduce noise in communication, let's discuss what noise is, and how it gets into the communication system.

Sources of Noise

The basic limitation on the speed and accuracy of any mode of communication—whether oral or written—is due to noise that distorts the message, with consequent confusion for the receiver. For this talk, we will take the usual physics textbook definition: noise consists of unwanted disturbances, especially those that are random and persistent, that obscure or reduce the clarity and quality of a signal.

A simplified communication model consists of (1) the source, (2) the message, (3) the channel, and (4) the receiver, all superimposed on a background of ambient

noise. A fifth element, that of feedback, establishes a link between the source and the receiver so that we can instantly evaluate how well the receiver is getting and understanding the message and so that the sender can modify or reinforce his message by reducing noise or by modulating the channel. Here we take modulation to mean any process that varies the signal for more efficient transmission, with the intent of superimposing intelligence on, or increasing the information content of, a carrier wave. The concept of modulation as applied to the editorial process may give rise to a quite different sort of noise if an author thinks his "style" is being violated.

In face-to-face conversation, noise comes from mispronounced words, distracting mannerisms, esoteric vocabulary, inattention, and such environmental effects as traffic, air-conditioner hum, and the like. To partly overcome interference, man's language is highly redundant so that many words and sounds in speech can be lost without serious effect on the message being sent. Redundancy allows man to detect signals in noise, and intelligibility can be achieved even when the noise intensity is very much larger than the message sound. This is described as the "cocktail party effect," as many of you will remember from the Wednesday night reception, whereby conversations can be carried on in an extremely noisy room. But just barely.

In conversation, we can use the instant feedback of a question, a raised eyebrow, a puzzled grimace, a rebuttal, or a glazed eye to alert the sender that the message isn't coming through.

All person-to-person communication suffers from noise, some more than others, but none so much as writing. The elements of the written communication system are (1) the writer, (2) the report, and (3) the reader. The system lacks an instant feedback channel that links the reader with the writer, and the first transmission has to be clear—and clearly understood. The reader has no way to influence the quality of the message except by angry "letters to the editor" long after the fact, and the writer cannot be certain that he is not creating noise.

In written communication, noise can occur at each of the three elements.

The writer can contribute linguistic noise at his semantic encoder. He may become the victim of his own semantic inadequacy that allows misfit words, mangled metaphors, and deadwood to creep in. The report itself may contribute typographic noise by printing errors, faulty reproduction, cluttered illustrations, and poor graphic design. Finally, the reader may be the victim of psychological noise, the source of which may be the message itself, semantic or typographic noise in the report, or some external or subjective effect.

Noise Abatement at the Source

Technical reports, by their nature, resist being measured by a common standard. But if there is any common measure for judging technical writing, it is organization—and faulty organization is most readily revealed by comparison with an outline.

Outlines

Writers fall into two classes: those who find outlines useful or indispensable, and those who consider them a nuisance. If you're in the first category, use an outline as a starting point and in-process guide; if you're in the second class, use an outline anyway but prepare it after the report is completed as a *post hoc* verifier.

Outlines have no standard form; they must be variable and flexible to suit the subject and scope of coverage. Nevertheless, an outline is as essential to solid writing as blueprints are to construction. The final product should not reveal the skeleton; the writing should be strong enough to hold the report together and solid enough so that no bare bones poke through. Minimum requirements for an outline are:

- State the epitome of the subject and your attitude about it.
- Give evidence to support your thesis.
- Summarize what you want the reader to remember, with sufficient support from evidence and sufficient clarity of expression to keep him from asking "So what?".

Another noise filter applied at the source is to remember that it is impossible to "tell all." The author must make a selection of data and arguments, but the selection must fairly correspond to the mass of evidence and it must offer a graspable design to the beholder.

Carelessness

The commonest source of noise is not the willful distortion of intent, but innocent lapses of attention that jerk us to wakefulness. It requires the unnodding vigilance of writers and editors alike to keep us from taking sweeping statements with "a dose of salts" rather than "a grain of salt."

Our daily work abounds with good examples of bad habits, all sources of noise. We have to know what correct usage is, which depends in part on knowing the difference between what a word denotes and what it connotes. We must draw fine shades of difference between *accuracy* and *precision*, between *activate* and *actuate*, between *alternate* and *alternative*. The list is long.

We must also watch for mangled metaphors that result from trying so hard to reach the descriptive high notes that the singer dies of syntactical strangulation. We all have lists of boners gleaned from our editorial labors. Some of my favorites are:

> "A virgin field pregnant with possibilities."
>
> "The need is evident for a list of physicists broken down by specialization."
>
> "No authenticated case is known in which sterile parents transmitted this quality to their offspring."
>
> "This publication fills a much-needed gap."

Our attention is demanded in culling out tautological repetition of the same sense in different words, as in "general consensus of opinion." And we must prune deadwood—it's as burdensome to prose as it is to a tree.

Someone may object that the distinctions are too finely drawn. Not so. Strictly speaking, technical communication is a matter of speaking strictly.

Spelling

A word is more than the sound it makes. It is, among other things, the way it looks on a page—and it looks best when it's spelled right. An author who writes with no misspelled words has already dismissed the first grounds of suspicion of the limits of his scholarship. He might remember that the fancy way of saying "correct spelling" is "orthography" (from the Greek roots *orthos* meaning *straight, correct, normal*; and *graphein* meaning *to draw, to inscribe*).

A good dictionary is a communicator's most useful single tool. An author who frequently consults a dictionary will usually learn something to his—and his reader's—advantage.

Proofreading and Goof-proofing

Examine the finished product to be sure that the message cannot be misinterpreted. Substantiate your claims, check your data, and ask colleagues for their opinions. If you are uneasy about your data or insecure in your interpretation, your writing will show it. And proofread! Proofreading is equivalent to goof-proofing. Look up words whose meanings have been dulled by familiarity, get the typos out of the final draft, and watch out for grammatical lapses. Don't be hasty to rush your literary brainchild to a baptism of printer's ink.

Editorial Modulation

Only rarely in creative activity, whether in research, in writing, or whatever, can we achieve a desired result at the first try. Rarer still is a draft manuscript that goes from writer to editor to printer without retracing part of its path for correction or improvement.

The act of creating any written piece starts a process that resembles the oscillation of a vibrating spring; this concept enables us to follow the path of a manuscript on successive trips between author and editor (see Fig. 1). Imagine that the initial displacement from the solution axis is proportional to the degree of uncertainty, and that the restoring force of a spring represents the process of evaluation and generalization. At the maximum amplitude of each oscillation we apply a "damping" factor that consists of the act of defining and refining, and thus limit the next oscillation. Successive definitions at peak amplitudes, as the draft goes from author to editor and back again, contribute to decreases in the degree of ignorance. The envelope formed by decreasing displacements of these quantities is the convergence of understanding. It approaches, at infinity, the truth.

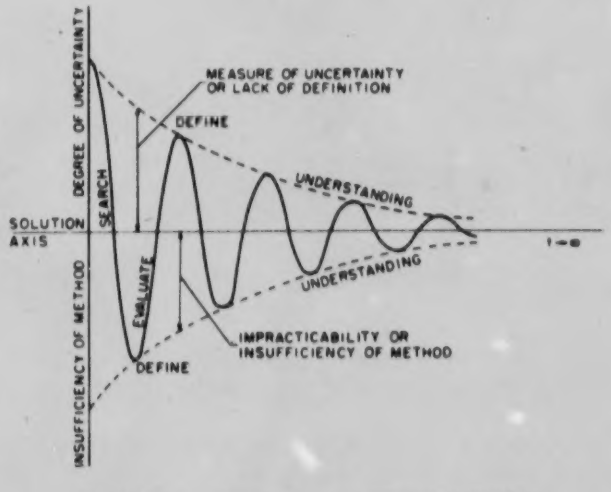


Fig. 1. The creative process as a damped oscillation

At the Los Alamos Scientific Laboratory, we construe editorial modulation to mean editing for consistency, organization, and language correction, with the specific intent of retaining the author's style and the accuracy of technical content. Some writers complain that an editor's efforts have changed the intended meaning. When that occurs, the writer was probably not clear in the first place. A writer who is concerned lest editorial modulation violate his "style" can best preserve it by

- Writing clearly and directly.
- Making sure of his facts and marshaling them in logical sequence—with the "news" of his findings or a statement of the problem first, followed by details and supporting arguments.
- Imparting the significance of his work to readers outside his field.
- Providing enough details of method and equipment so that others can repeat his work.

He should apply a noise filter at the source by avoiding overspecialized jargon and acronyms, by using the active voice in preference to the passive, and by using personal pronouns (I, we) where appropriate. "The present author" went out with "gentle reader," so say "I" naturally and honestly when it fits. "We," unless the work is reported by more than one author, is used only by royalty, editors, and people with a tapeworm. Finally, it is no sin to occasionally split an infinitive or to use a preposition to end a sentence with.

Noise Abatement in Report

Noise filters applied to the reproduction of a report are easier to use and control than the human factors of source and receiver. We can, by consistent and conscious effort, filter out printing errors, faulty reproduction, cluttered illustrations, overcrowded text, inadequate margins, stiff bindings, misplaced references, and poor display of mathematical expressions. The filter of language correction will take care of most lapses in punctuation, orthography, transitions, unity, consistency, and conformance to "house" style.

It is another matter, however, to nurture a happy editor–author symbiosis wherein writers accept the suggestions of editors who understand the limitations and requirements of printshop and audience, wherein editors learn the subject matter from authors in a mutual search for clearer writing, and neither insists on having his own way.

Noise Abatement at the Receiver

When we're at the receiving end of the communication chain, psychological noise may arise from misinterpreting the sender's intent, or from listening only to what we want to believe. Aside from this irreducible residuum of human cussedness, we know that the linguistic and typographic noise of a report, added to noise from the environment or from the recesses of our subconscious, can become psychological if it's bad enough. Our impatience with an author who seems not to be meeting his obligation of clear exposition can contribute to psychological noise. Noise filters at the receiver must, by and large, be applied by the receiver himself if he's willing to understand and takes the effort to seek and tune to the author's frequency.

Optimizing Signal-to-Noise Ratio

I guess it's possible for one person's noise to be another person's signal, but it is the relationship of what is relevant to what is extraneous that must be our constant concern. We, as communicators, are obliged to be source, message, channel, receiver, and feedback at one time or another—and sometimes we are asked to be all of them at once. To my mind, then, we must

- Have something to say (optimize the signal).
- Say is concisely and simply; avoid adjectival overkill (apply noise filters at the source).
- Say it in terms of interest to the reader (minimize noise at the receiver).
- Write correctly so that editors cannot distort the message or suppress the style (optimize editorial modulation; reduce noise in the report).
- Adjust the emphasis or choice of words as necessary to make sure that the message is getting through (pay attention to the feedback signal).
- Try to inform, not impress. Write as we would be written to.

Writing for Understanding

It has become a commonplace to say that scientists can't write. This is not true. Many of them write creditable prose every day, and some of them write very well indeed. To say that scientists can't write is an insult to those who do, and discourages those who should. Nevertheless, the quality of many manuscripts submitted to our Department for publication indicates that research scientists regard the recording and reporting of their work as an unpleasant addition to their already heavy burdens.

Nothing of the sort. Writing, rather than impeding research, may properly be regarded as the mechanism by which the work is accomplished.

Michael Faraday, the great British physicist and lucid expositor of his own work, is reported to have defined research as consisting of three steps: Start, finish, publish. Research, in this view, starts on the basis of well-made plans that define a specific field of interest and finishes when results are obtained that are of a degree of accuracy compatible with the experimental design necessary to prove the hypothesis. Results are then written and distributed in a clear exposition of observations made and results obtained. I would encourage the writing of laboratory notes in daily increments as a stimulus to the scientist to think about [illegible] work in a more organized way and to use the intellectual discipline of writing as daily feedback to the actual progress and shape of the work.

Some complicated concepts are difficult to explain in an uncomplicated way, but the intellectual challenge requires an attempt to solve puzzles, not create them. The challenge lies not only in achieving scientific and technical advances, but also in meeting the demand for conveying involved concepts clearly and concisely; additional effort is required to present good ideas effectively. Scientists from different disciplines, in their attempts to explain something to a third party, may become comprehensible to each other. It is not enough to be understood; we must make sure that we are not misunderstood.

From PROCEEDINGS, 1974

Semantics (Words Are Chameleons)

Don Bush

Semantics, the study of meaning, has a great application for technical writers. To quote Judge Learned Hand, "Words are chameleons, which reflect the color of their environment." This suggests that more emphasis should be placed on the context and connotations of our words. Technical editors can take the lead in helping technical people communicate better through the use of semantic principles.

We run into the word *semantics* most frequently when someone says "It's just a matter of semantics."

You may have heard the story about the company here in St. Louis. This firm made some kind of widget that was shaped something like the St. Louis Arch.

One day the foreman came in. The widgets were strewn all over the floor. He said to the porter, "I want you to straighten all of these out."

I guess you know what happened.

It cost that company—as I understand it—$7,000!

Now who was to blame? The porter? The foreman? Well, who can say? Perhaps it's "just a matter of semantics." But, as you can see, semantics can really make a difference.

When we say "It's just a matter of semantics," we are *identifying* a real problem, not solving it. We have merely begun to fight.

Now people where I work like to think of me as a "grammar" editor. "Just straighten out the grammar," they say, "and don't bother about the technical content."

But I can't do that. The technical content of an article is directly influenced by the language that's used to describe it. You can't separate the two. When there is something wrong with the language, the technical content is affected.

I view this as a tremendous untapped field for technical writers and editors. But we can't contribute in helping the technical people make their concepts come through clearly unless we understand more about how language works. And semantics is part of this picture.

It's all tied in with the "New English," which we've all heard so much about. The approach to the "New English" is to teach how the English language works, not how it *should* work. It is concerned with communication, rather than just correctness. Correctness is not enough.

This concept horrifies many people, of course. But what might make critics of the New English feel better is that

the study of communication is infinitely more complex and more exacting and more demanding than the mere formulation of rules of grammar.

In the first place, as you know, our English language is a dynamic thing, full of seeming inconsistencies and disorganization. It's tricky. It follows a discipline and a logic, all right, but the logic is sometimes not the logic that you expect. Let me read you something.

> LEXINGTON, KY., April 28—The woman had looked over just about all the clocks in Earl Cramer's furniture store. Finally, he held up a small model and explained: "This clock is the latest thing. It will run a week without winding." "How long will it run," the woman asked, "if you wind it?"

New Words for a Dynamic World

One of the reasons that language does not follow immutable rules, like algebra, is that we make up our language as we go along. When we need a word, we invent it. When we needed a word to express the capability of being produced we invented *producibility*. When we needed a word to express the concept of automatic destruction of a missile, we invented *self-destruct*, ignoring the old word *destroy*. When we needed a word that described the basic assumptions of a study, we adopted the word *ground rules* from baseball slang. These are valuable words today. We couldn't write technical reports without them.

Another way we expand our language is through metaphor. This means we use old words for new concepts. Thus, essentially, new words are born.

When an astronaut takes a space walk, he is tied to his spacecraft by a long cable that supplies him the life-[illegible] contact he needs with the mother ship. It is his lifeline. Some inspired writer, many years ago, began calling this line the *umbilical*, and a new technical term was born. This writer used a metaphor, an old word to express a new concept. There are many other examples—words that you use every day—that were creations of a real craftsman in the use of the changing, dynamic instrument of communication that we call the English language.

The Trap of Literal Meaning

Sometimes, technical people try too hard to cram individual words into "one true meaning." But word meaning depends almost entirely on context. This means it depends on the speaker, the audience, and the subject.

Lawyers know this, and that's why some lawyers are real masters of words. We sneer at legalistic English, but we forget that Noah Webster was a lawyer. Judge Learned Hand showed his grasp of English study when he said, "Words are chameleons, which reflect the color of their environment."

Literal meanings are deceptive. If I talk about a blackboard, you don't have any question about what I mean, even though the blackboard may be green. "Greenboard" is technically more correct, but it has never really caught on. "Chalkboard" is preferred, but it hasn't caught on universally either. Similarly, an orange stick isn't orange, a red dog isn't red, a black maria is seldom black, the yellow race isn't yellow, a greyhound can be tan, a violet can be white, a blue mood isn't blue, and a green hand or a green thumb is not green. Words are chameleons.

Similarly, a french curve isn't distinctively French, india ink is not Indian, body english is not English, a dutch treat is not Dutch, and italics are not necessarily Italian.

Can't you see that this would bother some people? Of course it does. I have seen hours of valuable time wasted by literal-minded engineers, who argue that the Skylab astronauts don't re-enter the Earth's atmosphere, since they have not entered previously, even though *re-enter*, like *rebound*, is a common and well-established word for a specific phenomenon. Similarly, technical people may insist that the moon can't have *terrain* or *geography*, since *terra* and *geo* are combining forms meaning *earth*, and earth only. But they don't stop to think that software is not soft, a hat section is not a section of a hat, an aircraft waterline never touches the water, a bootstrap is not a strap, or that a totem pole is not a pole.

Now some of you may think that I'm trying to say precision in words is not important. I'm not saying that at all. As Mark Twain so aptly said, the difference between the right word and the almost right word is the difference between lightning and the lightning bug. We have to use the right word, the precise word, in order to communicate at all.

But we must tie the precision of our language to the experiences of the reader, rather than to any kind of arbitrary standard imposed by the writer himself, or by what he insists is "correct." It does you no good to insist that a cocktail glass is not a glass when it's made of plastic.

People will think you're a nut. (A figurative nut, that is, and not a literal one.)

Words can easily have two distinct meanings. In technical writing, we have a ringside seat for observing this characteristic. We have mathematical models and wind tunnel models, light tables and look-up tables, computer programs and space programs, and even programmed space. Words obviously depend upon their environment for their meanings. (Note that almost every word in English has more than one meaning. It's not an isolated phenomenon. Think of *glasses, stable, ring, flush, set, watch, type.* You must know the context before you know the meaning.)

The Sentence as an "Idea Module."

Context itself is not always logical. Let's take an example. The word *required* means *necessary*, or *needed*. But look what happens when we insert each of these synonyms into a very simple sentence:

"Mechanics are *required* to maintain aircraft" probably means that mechanics have to maintain aircraft.

"Mechanics are *necessary* to maintain aircraft" probably means that the aircraft don't maintain themselves.

"Mechanics are *needed* to maintain aircraft" probably means that we need to train more mechanics.

Words are chameleons that reflect the color of their environment.

Now, you can say that all of these sentences can, in fact, be used to say that we need to recruit more mechanics. But that simply suggests that these simple, six-word sentences are ambiguous, that they can mean more than one thing, and that the sentences themselves are affected by the broader context of the paragraph.

Note that the meaning shifts in unexpected ways when we innocently add words. When we put the obvious adjective *trained* ahead of *mechanics*, all three sentences come to mean about the same thing: training is vital. The emphasis shifts, the meaning changes, and most of the ambiguity disappears.

Good technical editors must be aware of such language phenomena. The difference between *binding books* and *binding regulations* is the difference between lightning and the lightning bug.

All of this suggests that the real meaning of our language does not derive from individual words as much as from the way that they are strung together. In other words, the sentence, and not the word, is the building block. The sentence is the idea module—the smallest unit of thought. It might help the readability of our technical writing if we would think of language this way.

Is Exact Communication Possible?

Semantics, as I say, is the science of meaning. It has the same root as *semaphore*. Both of them come from the Greek word for *sign*.

The term was invented by Michel Breal, a Frenchman, who wrote a book in 1901 called *Semantiques*. Originally, the methodology involved word origins. Then it was expanded into a whole new philosophy, involving thought processes and conceptions, and ultimate meaning, by Alfred Korzybsky. Korzybsky's ideas were popularized and perpetuated by several other men. Two of the most prominent are Stuart Chase, who wrote *The Power of Words* and *The Tyranny of Words*, and S. I. Hayakawa, later president of San Francisco State College, who wrote *Language in Action* in 1941.

These men pointed out something that all of us know. Communication is difficult. But even further, they wanted us to consider that communication—exact communication—is actually impossible. Let me tell you why.

We all have different concepts of the things about us. My senses and my thought processes are different from those of anybody else.

Let's consider just one thing—color. We know what we mean by *yellow*—but actually, yellow looks different to each of us. We each have a different impression and point of view. To take an extreme example, how about the man who has poor eyesight, or who may be color-blind? He has a conception of *yellow* that is quite different from that of a so-called normal person. But all normal persons, also, have unique conceptions of that color. No two are alike.

Then, how is it, when someone says "yellow," we all understand the term? It is because, from early childhood, we have communicated with others and we know what everybody else means by *yellow*. We adapt our personal impression, as gained from our senses, to conform to the consensus.

Yellow then becomes the symbol by which we identify to others what we see when we look at a yellow color. To say it another way, language is convention.

Take a simple pencil. A pencil is a pencil, isn't it? But not to a German. It's a *bleistift*. To a Mexican, it's a *lapiz*.

Then what is it? We can't say—literally—that it's a pencil, because pencil is simply the name we give it. The word *pencil* is different from the thing "pencil." And that thing can go by many different names.

The Word Is Not the Thing

The word, therefore, is not the thing. The word is a label. It is a symbol.

Now it's OK to talk about hard things like pencils and desks and radar sets to all people who speak English. As imperfect as the system is, it works, and by these words, we communicate.

But what about words like *democracy*? *program*? *dissent*? *criteria*? *creativity*?

It's important to realize that these words are merely labels, attached to suit ourselves. These labels may be attached by other people to things that are quite different.

The Connotations of Our Words

When we use the word *politics*—what do we mean? Something dirty? Something useful in business? Something that we study in political science? In technical writing we throw around the word *science*, don't we? And *research*. And *management*. And *control*. And *environment*.

How do you know, when you say *management*, that you mean the same thing that I mean?

I can tell you this—we definitely mean different things. We have different concepts of the term; the problem is to get these meanings close enough together that we can communicate, so that our thoughts can meet each other instead of passing each other like ships in the night.

But it gets still more complicated. We ourselves use words in different ways. What do we mean by *compute*? Do we have to use a computer? Sometimes that's what we mean, sometimes not. What do we mean by *analyze*? Is it the same as *study*? Sometimes yes, sometimes no. What do we mean by *configuration*? Is it the same thing as *shape*? Again, only sometimes. It's a matter of connotation.

The Trouble With Definitions

In technical and academic writing, we have a panacea—a cure-all—for this problem. We often think that all we need is "definitions." If we define our terms, everything will be all right.

But we obviously can't stop to define each word as we use it. Similarly, glossaries at the front are not a solution, because it won't occur to the reader to look up common words like *analyze*.

Also, definitions don't completely solve the problem. All they do, really, is to substitute one set of symbols for another set. One word for another word. We can never actually convey our exact impression to the other person, because—to get back to our original statement—the *word* is never the *thing*.

Thus, we have to work on the context. If we are contrasting configuration with shape, the context should make it clear. If the study includes analysis, and if it's important to make a distinction, we should point out what else the study includes, besides analysis.

There's a danger here, of course. One of the troubles with technical writing is that it's already cluttered with explanations, qualifications, and exceptions. We take too many pains to belabor simple details.

It's often obvious that we consider the reader to be incredibly stupid (even though we're careful not to insult his intelligence by using short words and short sentences).

So, we're back to Lesson I in the fundamentals of technical writing. We have to put ourselves in the shoes of the reader. The true meaning is not what the writer thinks it means, but what the reader thinks it means. As writers and editors, we have to keep our brains turned on and figure out what makes the most sense to the reader. We have to plan, and think, and even scheme, about ways of getting our message across. It's not enough to point to the dictionary, because the dictionary, like the Bible, can be used to justify many sins.

Connotations depend strongly upon the particular audience. Engineers are called *technically oriented*. Nothing wrong with that, unless you're among a group of social scientists, or artists. Then it has a connotation of ignorance, or insensitivity. "Oh well, engineers are technically oriented."

Several years ago, a man designed a new chess set. He assigned new labels to the pieces, which is certainly his

semantic prerogative. Instead of "black" vs "white" he pitted "good" vs "bad." The good side had pieces labeled "soul" and "love" and "happiness." The bad side he called the "technological society." What would scientific America say about that?

Using Labels for Effect

Changing labels is an effective semantic principle, if it can be done. Labels do affect our thinking.

If we consider the stock market an *investment*, we'll buy stock. If we consider it a *gamble*, we won't. *Youth* is the hope of the future, but *kids* are irresponsible. A newspaper interview can be called either *the people's right to know*, or a *news leak*. In technical writing, we have learned that the customer won't buy *far-out concepts*, because he's saving his funds for *advanced designs*.

Our language is full of connotations. If we're smart, we'll use them to suit our purposes.

One thing we don't realize is that words often assume meanings that we don't intend. This is partly because the reader is skeptical.

Take a word like *true*, for example. When someone urges me to listen to the "true" facts on Watergate, I brace myself for a thoroughly biased and one-sided opinion, for or against Richard Nixon. Note that the dictionary gives no hint of this important connotation.

In short, many words tell us more about the speaker than about the object.

Sometimes this loading is entirely benign and innocent. I have a 12-year-old boy. Through the years, I have periodically remarked on how big he's getting. He's still less than five feet tall. Am I lying? No. To me, he just keeps getting bigger and bigger and bigger.

Thus, the word *big* doesn't really tell much about the boy, but it does tell a lot about my own attitudes. I can tell whether a man is a liberal or a conservative by what he calls the "truth" about Ted Kennedy.

Objectivity in Technical Writing

As our own Earl Britton points out, the object of technical writing, of course, is to stick as close as possible to objective, empirical, solid fact, in order to create pictures in the mind of the reader that are as hard and unambiguous as tempered steel. One way to do this is to use conventional, standard measurements about which there is no disagreement. A table is 60 inches long. A house has 1100 square feet of floor space. A boy is 5 feet tall. We do a good job of this in technical writing.

Note, though, that this does not prevent us from using connotation for comparison. The house has *only* 1100 square feet. The width was *increased* to 30 inches. These sharpen the image for the reader and define the problem.

Of course, even when we stick to measurable quantities, bias can slip in. A statement that the equipment was 36 inches wide and the door was 30 inches *implies* criticism, no matter how accurate the analysis.

Opportunities for Editors

There are many other pertinent aspects about semantics. I don't have time to talk about all of them.

But it seems to me that its main contribution is its focus on meaning, and its emphasis on the importance of language in the development of technical ideas, as well as their description. You can't separate language from idea.

That's why I consider editing as having a much broader scope than the correction of grammar, spelling, and format. It must include logic, and meaning, and the whole complex interface between language and thought.

The emerging technology of linguistics suggests an opportunity for us technical editors. If we agree that content and information transfer are our goals, we can devote ourselves to learning more and more about semantics, linguistics, and language, and perhaps we can gradually restructure the prevailing approach to correcting technical copy. We can introduce technically oriented people to the state of the art in language study. One small thing is that we can focus our efforts on sentences, rather than on individual words. Little by little, we can exercise leadership that will have a tremendous impact on the quality of communication in our technical reports.

Perhaps you don't agree. Certainly it's not a simple task.

In any case, there's one point I would like to emphasize. Whenever you say "It's just a matter of semantics," you are not merely describing an isolated quirk in English vocabulary; you are seeing the tip of the iceberg. You are catching a glimpse of the massive problems we all face when we are trying to communicate technical information.

From PROCEEDINGS, 1965

Jargon and the Technical Writer

Wallace Clements

As technical writers we cannot avoid handling jargon, for it is woven into the technical language we deal with. How to handle it is the question. If we are to take our share of the responsibility for building the new technical language, then we must actively foster the good jargon—even help with the inventing of it—and suppress the bad. This implies recognizing jargon, forming rules to guide us in using it, and developing standards for judging its quality.

Whether we like it or not, there will be jargon. More and more of it. Science and technology are fertile breeding grounds for new expressions invented to help communicate new ideas and phenomena. These new expressions keep adding to the already substantial body of specialized terminology we call jargon. This jargon is woven into the technical language we deal with, and we cannot avoid handling it.

How to handle it is a question on which technical writers disagree vehemently. For example, I have one friend who won't handle jargon except with a 10-foot pole—and then only when compelled to. He would prefer never to sully his typewriter ribbon with it. A fervent custodian of the language, he worships at the shrine of *Webster's Second Edition* and eschews its apostate successor.

I have another friend who is just the opposite. When faced with a writing job in a field new to him, he first familiarizes himself with the jargon and then proceeds to use it at every opportunity in his writing. He takes it as he finds it, uncritically, and dispenses it as freely as a salesman gives away calling cards.

These two approaches to handling jargon certainly represent the extremes we should try to steer between. But we should do more than just steer a vaguely defined course somewhere near the center for the sole purpose of staying out of trouble. What we really need is the ability to handle jargon in the sense of managing it. This implies recognizing what jargon is, forming rules to guide us in deciding when to use it and when not to, and developing standards for judging its quality. When we have jargon thus under control, we can hope to emerge from our passive role of merely echoing the jargon that is coined by others, and actually take a hand in shaping it ourselves. We can further the cause of the good jargon by using it, and hasten the demise of the bad by suppressing it. In this way, we can take our proper share of the responsibility for building the new technical language.

Recognizing Jargon

An essential prerequisite to handling jargon is the ability to recognize it. To discuss this point I must define what I mean by jargon. I mean words or expressions that carry special meanings within one field of activity, but which outside that field of activity may have other meanings or make no sense at all.

Within this rather broad definition of jargon one can distinguish two subclasses: jargon which arises from the need for more precise and economical communication between workers in a field, and that which arises from the clannish urge of the group for a private language to mystify and impress the uninitiated outsider. The first kind of jargon is all we will be concerned with here. The second kind is foreign to technical writing, notwithstanding the occasional efforts of some of us to "naturalize" it.

How do we recognize jargon? We must rely primarily on our own language sense to spot it. In other words, we must try to maintain a true ear in which jargon, like grammatical errors or misspellings, rings false. Some jargon we can identify as such immediately and with certainty. But much of it we can't be sure about until we check it out in an unabridged dictionary or with knowledgeable persons. It is therefore important to develop skill in spotting expressions that *might be* jargon, that ring false, for this is the essential step in recognizing it. Once a suspect has been identified, checking it is a rather routine matter.

There is a pitfall here for any of us who have become very familiar with the terminology of a particular field. We may have taken its special language so much into our own vocabulary that we no longer recognize it as jargon but think of it as part of the general language. I found an extreme example of this kind recently in a paper by a young engineer, who used the expression "short circuited" and then followed it immediately in parenthesis with "i.e., crowbarred." To him, apparently, "crowbarred" was the standard expression and "short circuited" the one readers might not recognize. Somehow he had gotten his input leads crossed, so that when he pulsed his memory, its output was a full 180 degrees out of phase.

Using Jargon

We are concerned about recognizing jargon because we want to control how we use it. And let me assert at this point, if perhaps belatedly, that there is nothing wrong in using it. The only question we need ask is: will it help communicate better? If so, then we should take advantage of it.

The most important factor in answering the question of whether it will communicate better is the audience you are writing for. If it consists of people who work in the field you are writing about, then the familiar jargon will certainly help communicate to them. But be sure it has general currency in the field. If you have any doubt about this, you may still use it, but back it up with contextual clues to its meaning. Even with jargon expressions that are widely understood in the field, it is only prudent to set them in a context that suggests something of their meaning. Clues can be woven unobtrusively into the text in a way that will not offend even those most sensitive about being "written down" to.

I said above, "be sure it has general currency in the field." This is something like advising your son not to associate with strangers unless they are honest—easy advice to give, but how can he tell? More than once I have been assured by a specialist that a certain word or expression he favored was widely known in his field, only to discover later that its sphere of usage did not extend beyond the walls of the building where he worked. This difficulty of determining how widely a jargon term is understood makes it more than ever important to anchor jargon firmly in a structure of good writing built of words and expressions that everyone understands.

When the audience is general and nonspecialist, which is frequently true for technical writing, jargon can still be used to advantage. But here it should be used with somewhat more discrimination. With such an audience it is of course necessary to define every jargon term if you want to get through to all the readers. So in this situation jargon is worth using only where it gains more for you in better communication than it costs you to clarify its meaning. In other words it's a *tradeoff*, as the design engineers would say.

Eric Partridge, in his book *Usage and Abusage*, quotes some advice given just after the turn of this century by Greenough and Kittredge in their then popular book *Words and Their Ways in English Speech*. The advice is as sound today as it was then.

> The propriety of using technical terms in speaking or writing depends on a common-sense principle. A remark should be intelligible, not merely to the speaker, who is presumed to know what he wishes to say, but also to the person addressed. Otherwise, it can

hardly be called language in any proper sense. To be very technical in conversation not only savours of pedantry but makes the speaker unintelligible; and the same is true of a book addressed "to a great variety of readers." Among specialists, however, one can hardly go too far in the employment of technicalities, provided the terms belong to the accepted vocabulary of the science or art in question.

Quality in Jargon

Earlier in this discussion I suggested we could help further the cause of good jargon and discourage the bad. Now I want to offer some of my opinions on what constitutes quality in jargon, and how to judge it. This is an important consideration because the rapid growth of legitimate new words and expressions is hard enough for the workers in science and technology to cope with—to burden them further with unnecessary and poorly conceived expressions is more than they should have to bear. As technical writers we are working at the frontiers of language, and we are in a position to exercise some influence on it. We have the responsibility and the opportunity to lay a restraining hand on any careless or needless proliferation of jargon. Let's start doing it.

Here are some questions we should ask before honoring a jargon expression, particularly one that is not yet well established.

Is it necessary? If it does not communicate either more accurately or more economically, then it is not necessary, and let's not promote it. Nor is it necessary if there already exists a legitimate word in the language for it. Often a new expression is coined unnecessarily because the originator is ignorant that the very expression he needs already exists in the language. Necessity is the mother of invention, we say. But when necessity plus ignorance are the parents of language invention, the offspring are likely to be unwanted, unnecessary jargon—a population explosion we can well do without.

I think of the graceless word *destruct* that we hear so often in connection with missiles. I can imagine how it got started: the word *destruction* abbreviated on some button on a control panel. But why, oh why, couldn't that button have had *destroy* on it instead? Then we'd have been saved from such inanities as "Col. Solidfuel gave the destruct order five seconds after launch," or again, "stand by to destruct the missile at the slightest malfunction." I can only say, with Charlie Brown, "good grief!"

Does it have a sound etymological basis? In other words, is there some logical connection between the expression and the meaning assigned to it? There should be, or else the expression will not be learned or understood easily.

Here I take some examples from seismic exploration for oil, which involves detonating an explosive charge in a deep hole and recording the seismic waves it sets up in the earth. An important measurement is the time required for the shock wave to travel from the detonation point to the surface of the ground. This is commonly called the "uphole time," certainly a logical name for it, and a good example of what I mean by an expression with a sound etymological basis.

The uphole time is usually abbreviated on computation forms as t_u or t_{uh}, the t standing for time and the u or uh for uphole. Again, a logical designation. But one major oil company abbreviates it, and indeed also calls it, the "bug." The story goes that a high company official visited the field one day and watched the recording of a shot. He noticed the blip on the oscilloscope screen made by the uphole time arrival and asked, "What's that bug?" Since then, that company has called the uphole time the bug, even on its seismic computation forms. It may sound incredible, but I have seen the forms and know it's true. It bugs me every time I think of it!

Is it distinctive? We should be careful not to choose words or expressions that have well-known meanings in the general language, and jargonize them by giving them new and special meanings. This sets the stage for confusion whenever the expression appears. Consider the word *reefer*. In England it means a tight, double-breasted jacket. In America during the past few decades its popularized meaning has been a marijuana cigarette. But among people who set up and supply field kitchens, *reefer* means *refrigerator*. I think they'd have been wiser to call it *fridge*, as the Canadians do, and leave *reefer* to its previous meanings.

Among people who work with nuclear reactors, the word *scram* means a sudden or emergency shutdown of the reactor. We might question whether this is distinctive

in view of the other meaning of *scram*—to get out in a hurry. But reactor workers tell us that in any situation where a reactor scram is necessary, people in the vicinity would be well advised to scram also. So there is really no conflict.

Much of our technical jargon today will become the public's language tomorrow. As technical communicators we can exercise a guiding influence and help make these contributions to the language as apt and viable as good language should be.

From TECHNICAL COMMUNICATIONS, March/April 1971

Paragraphing in Technical Writing

John B. Colby

Good paragraphing is characteristic of professional writing. Knowledge of types of paragraphs and paragraph movement, plus use of the summarizing topic sentence, will help a writer understand and use the tools of his trade to do a better job. Mr. Colby gives a review and analysis, with examples, that should be useful to many communicators.

A paragraph, my new desk dictionary tells me, is "a subdivision of a written composition that consists of one or more sentences, deals with one point, or gives the words of one speaker, and begins on a new usually indented line." My Perrin's *Writer's Guide*[1] goes a bit further into the subject, devoting 46 pages to it (including exercises). Somewhere between the dictionary's impoverished definition and Perrin's abundance of thought must lie a manageable area that will enable the practicing technical writer to review the subject quickly and put it to use. For it appears to me, and possibly to some other editors, that good paragraphing is a vanishing—but useful—art, like good cabinetmaking and blacksmithing.

Changing Style

Perrin, Weisman,[2] and countless others who have written on the subject point out that a paragraph is a basic unit in the development of a subject. Let me add that the paragraph is peculiar to writing; we can readily perceive that speakers use sentences just as writers do, but it is difficult to recognize the spoken paragraph. I deliberately inject this comment because I think I have stumbled across something new. Nowhere have I seen anyone write this down. I stake out a claim on it, therefore, and I hope to soon find references to it in the literary efforts of others.

Students, neophyte writers, and sweaty engineers laboring over a draft of a report worry about the proper length of a paragraph. The length of a paragraph depends a great deal on the current style. A hundred years ago paragraphs were quite long; Victorian novels featured paragraphs that ran a page or more. In *The World of Mathematics*,[3] James R. Newman reprints a lecture by William Kingdom Clifford ("The Postulates of the Science of Space") written about 100 years ago. This early technical writer opened with an 1100-word paragraph. The abnormal length fits Perrin's observation that philosophical works and journals tend to have longer paragraphs than the more popular writings do. Newman says that Clifford had a singular power for making hard concepts understandable; if what he says is true, then we see at once that paragraph length has little to do with ease of understanding. Of course, we should recognize two things about this example. The first is that if someone took Clifford's lecture down in shorthand and then converted it

to writing, he may not have had the slightest idea where to paragraph. The second is that regardless of his ability to explain, very few of us could ever understand much about Clifford's subject, which was really non-Euclidean geometry.

In contrast to Clifford's cross-country paragraph, modern writing, including technical writing, is characterized by paragraphs that run to 100 to 150 words. Newspapers and magazines use even shorter paragraphs, often only one or two sentences (20 to 50 words). When I apply the criterion of units of thought to modern paragraphing it seems to fail. I believe the real reason for the 150-word paragraph in technical writing is that most writers nowadays get their material typed double-spaced. Now, a full page of double-spaced typing looks bad; it looks as if there ought to be a paragraph in there. So the author or editor paragraphs, usually about the middle of the page. This works fine as long as one uses identation to indicate a paragraph. If, on the other hand, block paragraphs are used, a problem comes up when a paragraph ends at the bottom of the page near the right-hand margin. In this case, the editor cannot tell that a paragraph was intended at the top of the next page. This aggravates him, especially if he is marking copy for a printer.

Utility of Paragraphs

Some claim that paragraphs help break up text into units of thought that readers can assimilate more quickly and readily than if they weren't used. This may be true, but I know of no evidence that it is. Who has methodically studied the absorption and retention of paragraphed versus unparagraphed writing?

The real utility of paragraphing, it seems to me, accrues to the writer. What he wants to do is arrange his work in an orderly fashion, and good paragraphing helps.

Types of Paragraphs

To find an orderly arrangement, it helps to look at the types of paragraphs used by most writers in the trade. A block diagram may be the best way to indicate different types of paragraphs and how they are used to develop a section of a report. (Actually, there are probably better ways, but block diagrams are fashionable and are widely accepted by engineers. So I contrived this diagram.) As Fig. 1 shows, a report or a major section can be led off with an introductory paragraph. A transition paragraph, probably very short, can be used to link the introductory paragraph with the first text paragraph. Then follow several text paragraphs, as many as needed to develop the section. Finally, it might be useful to review what has been described to this point, especially if the content is complex, so a review paragraph might be written. This can be followed by a summary paragraph that contains conclusions drawn from what has been presented so far. This might also serve as an introductory paragraph for the next major section. As the diagram indicates, this sequence is repeated until the subject or the writer is exhausted.

Paragraph Movement

A paragraph should move, Perrin says, so that the reader at the end of it is better informed than he was at the start. Perrin lists five main types of movement: narrative, descriptive, support, climax, and pro-and-con. A narrative paragraph depends on movement in time for its development. In technical writing, we do not often follow a chronological development, so we do not often write narrative paragraphs. However, an introductory paragraph often has characteristics of time:

> This project was initiated in 1965, when the sponsors agreed to fund it to the extent of $100,000. Early in 1966, the project was

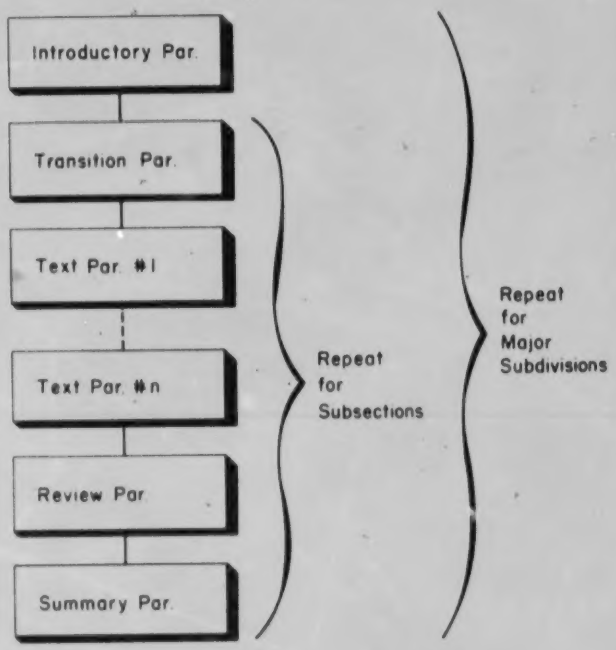


Fig. 1. Types of paragraphs

staffed, space rented, equipment purchased, and implementation began. . . .

A text paragraph might be descriptive:

> The assembled space platform is about 10 feet high, 40 feet long, and 10 feet wide. Viewed from the front, the living quarters are on the left, the laboratories in the center, and the service module on the right.

Most technical writing makes frequent use of the support paragraph. Often, a writer makes a general statement (a topic sentence) then follows this with detailed statements giving the evidence that supports or particularizes his lead:

> The search for commercial deposits of oil and gas is becoming more difficult. In recent years, the average depth of exploratory wells has increased from 5000 to 8000 feet. More wells are being drilled offshore, some in waters more than 1000 feet deep. The reason for this is that in the continental United States big pools of oil (greater than 10 million barrels) are found less and less often. The explorationist is forced to search for large deposits in remote areas and at greater depths.

The pro-and-con paragraph is often used in technical writing, usually to give both sides of a question or argument, or to discuss the advantages and disadvantages of something:

> Color photography is the best way of recording the differences in the samples collected. The yellows, greens, and browns contrast vividly, enabling the analyst to classify and quantify the particulate matter present. The cost of color photography is much higher than black-and-white, however, and reproduction in printed reports is expensive. Furthermore, the shades of color vary from time to time, apparently because of differences in batches of film and in batches of processing chemicals. Consequently we cannot depend on color matches to infallibly indicate a particular element. What we must do is decide whether the advantages of color photography more than offset the disadvantages.

Climax paragraphs are probably used more often than they should be. This type of paragraph starts with particulars and builds up to a general statement, or climax. The writer may choose this method deliberately, or he may resort to it subconsciously when he feels that the generality would not be acceptable to the reader (perhaps because of prejudice). So he backs into it. Only when he feels he has presented enough detailed evidence does he spring the generality.

Let us suppose, for example, that a researcher was employed by the smog industry to study the effects of smog on health. Obviously, the investigator would not want to antagonize smog industry leaders at the very outset of his report:

> Extensive investigations have been made of the effects of smog on lung, heart, and eye diseases. Experimental and control groups of rats were used for subjects, and concentrates of 25 different types of smog were administered in controlled breathing experiments, by injections, and by eyedrops. Statistical techniques plus thorough medical examination of the subjects were used. Carcinogenic and coronary symptoms were developed by rats in both groups. Whether deviation from the norm is significant is a matter of some debate, and the final analysis of the results has not been completed—indeed, further tests are warranted. Nevertheless, we feel we can only conclude at this time that further inhalation of or even exposure to smog should be avoided where possible by young, healthy people, should be minimized by adults, and will be absolutely fatal to debilitated, elderly people.

Organizing the Paragraph

Most authorities agree that the modern paragraph should be organized around one topic, and many teach that a good paragraph contains a topic sentence. By topic they mean the immediate subject—and this should be gotten clearly in mind.

The topic sentence may appear as the first sentence, it may pop up somewhere in the middle, or it may be the last sentence. In the pro-and-con paragraph given earlier the topic sentence appeared first; in the climax paragraph, it came last. It takes some skill to organize good paragraphs in which the topic sentence appears in the middle or at the end. Consequently the unskilled writer would do well, in my opinion, to start most of his descriptive, support, and pro-and-con paragraphs with a topic sentence. This helps him keep his mind on the immediate subject; he is not as apt to wander into

momentary digressions. Then, having disposed of the topic, he can write another topic sentence and so on. Even better than the topic sentence is the summarizing topic sentence.

Summarizing Topic Sentence

Mrs. Melba W. Murray, who has written an excellent book called *Engineered Report Writing*,[4] teaches the use of the summarizing topic sentence. In brief, the summarizing topic sentence gives the essence of the topic to be discussed; it gives information that is immediately meaningful, and the paragraph is then developed to support the statement made. For example, let us use the smog paragraph we offered as a climax paragraph, rewriting it for our new purpose.

The *topic* is:

Smog

A *topic sentence* would be:

Inhalation of smog should be avoided.

A *summarizing topic sentence* would be:

Investigations of the effects of smog on health force us to conclude that it causes irreparable damage to the heart, lungs, and eyes.

The summarizing topic sentence is a good lead sentence for a paragraph. The author can develop his paragraph by bringing in information needed to support his opening statement, or assertion. When he has brought in enough detail to be convincing (this is a judgment), he can go on to the next paragraph.

Continuity and Transition

Inside a paragraph, continuity can be established by using a *recognizable* flow of thought. Recognition is helped by repetition, i.e., using the same words or phrases, especially key words. Contrast helps (using words like *however* and *but*). Continuity-establishing words (such as *therefore, hence, because, consequently,* and *subsequently*) are essential. Reference pronouns help. For example:

> Mathematical and data-processing techniques that employ digital computers have entered more aspects of our lives than most vigorous proponents dreamt of ten years ago. We all expected *computers* to be extensively employed in science and technology. *But* few of us anticipated that *they* would bill us for air travel, for meals and lodging, for purchases in stores. *Few of us* realized that *computers* would become slaves of the Internal Revenue Service, checking and cross-checking our tax returns with absolute accuracy at inhuman speed. *Computers* and their associated *mathematical techniques* are such basic technical tools today that little attention is attracted by *their* use in designing aircraft, space ships, automobiles, ships, buildings, systems, and molecules. *Computers* set type, direct machinery, write music, check spelling, and control traffic. Those who do not comprehend the vast usefulness of *these electronic calculators* fear *them*. *Those* who do, however, appreciate that *because* of *them*, man is capable of making more progress—real *progress*—in the next few generations than he did in all history.

The italicized terms are key words, pronouns, and conjunctions that were deliberately used or repeated to establish continuity. Most paragraphs with continuity are sprinkled with words like these; they are characteristic of a skilled writer. An unskilled writer would do well to practice their use.

Some authors have difficulty developing sections in which one paragraph leads readily and smoothly into another. My experience, however, is that one well-constructed paragraph leads readily into another, so the problem is solved from the outset by constructing a good opening paragraph.

Let us consider the summarizing topic sentence given for the paragraph on smog. The writer might proceed with this paragraph by writing sentences concerning the investigations, the effects of smog, and what it does to the heart, lungs, and eyes. Since very little detailed information can be packed into a sentence, the writer might then write whole paragraphs and sections giving progressively more detail on the investigations, the effects of smog, and so on.

Two devices help in tying paragraphs together. These are the forward and backward references. If he wished to go from his opening paragraph to the next one using a forward reference, he might close his first paragraph with a statement like this:

> Since our experimental techniques are new in this type of work, we shall discuss them briefly

> before discussing the specific effects of smog on health.

Then he goes on with his next paragraph. On the other hand, he might have decided that he did not want to spoil the effect of his climax, so instead he opens the next paragraph with a backward reference:

> The importance of inhalation and exposure was shown clearly by the investigations conducted, which are new to this type of work and so shall be discussed briefly before we go on to the specific effects of smog on health.

Notice also that both the forward and backward reference indicated that after the description of the investigations there will appear a paragraph (or maybe section composed of several paragraphs) on the specific effects. Simple as they are, these devices are of great help in organizing a document that has continuity.

Importance of the Summarizing Topic Sentence

The importance and utility of the summarizing topic sentence cannot be overemphasized. Its use has been taught and encouraged at Esso Production Research Company for several years. Those who employ it report that it helps in expanding an outline into paragraphs and paragraphs into a readable report. In fact, as Mrs. Murray points out in her book, it leads writers into a new way of looking at their material, and it is an effective way of designing reports. Feedback from recipients of reports is that they are more readable and more useful when they employ summarizing topic sentences as lead sentences. In addition, expanding an outline with summarizing topic sentences cuts the length of reports by 25 to 50 percent without sacrificing content, reduces writing time by about the same percentages, and reduces time required for approval through channels.

I have found that I can skim a report organized and written in this way, reading only the first sentence of each paragraph, and then do a creditable job of summarizing the report. This means that technical information processing people could probably prepare an abstract of such a report quite readily, and searchers could do a better job of finding the desired information.

Summary

In summary, use of summarizing topic sentences focuses the writer's and reader's attention on the immediate subject. It helps organize sentences into paragraphs and paragraphs into sections. Use of summarizing topic sentences to expand an outline results in better, shorter, and more useful reports that get approval more quickly. Knowledge of types of paragraphs (introductory, transition, text, review, and summary) and types of movement (narrative, descriptive, etc.) will help a writer understand and use the tools of his trade to do a better job. Length is partly dictated by style (modern paragraphs are rather short), but it should be dictated by what the writer has to say about the immediate subject (topic).

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From PROCEEDINGS, 1974

Ambiguity: An Exercise in Practical Semantics

Charles R. Stratton

An ambiguous word, phrase or sentence is one that has two or more distinct meanings—as opposed to a vague word, phrase or sentence, which has little or no meaning. Ambiguity is a serious problem when the author is aware of what he means but is blind to alternative interpretations of what he writes. A major contribution of the technical editor lies in identifying and resolving ambiguities. There are two varieties of ambiguity: lexical and structural. Structural ambiguity is by far the more serious semantic problem. Editors can react to ambiguities by identifying them and having the author resolve them or by resolving them one way or the other themselves. There are advantages and disadvantages to each method.

Introduction

To the language scholar, an ambiguity is a single word, phrase, clause, or sentence that has two or more meanings, or semantic interpretations. Thus to label a construction "ambiguous" in this technical sense is to say that it can be understood in two or more distinct and precise ways. But the word *ambiguous* has another more general meaning. As we all remember from freshman composition, *ambiguous* is a label that English teachers like to sprinkle in essay margins (along with *vague* and *awk*!) to indicate that "There's something wrong here but I don't want to take the time to explain it." Usually what's wrong is that the meaning is imprecise, out of focus, or missing altogether.

Thus, the word *ambiguous* is itself ambiguous, at least in the technical sense of the word. And it is in this technical sense that I will use the term in this paper: *ambiguous*, said of a linguistic construction, means having two or more distinct meanings. I prefer to reserve the term *vague* to describe a construction that has no precise meaning at all. Both, of course, are instances of awkwardness—or lack of clarity—in writing, and together they constitute a serious problem not only for the English teacher but for the technical editor as well. But I think the distinction is worth making, and I commend it to you: *ambiguous* to designate two or more meanings; *vague* to designate little or no meaning.

Levels, Constructions, and Types of Ambiguity

Linguists and other language scholars regard language as being hierarchically structured. That is, they regard language as having a layered or stratified structure, with an element in any given layer being made up of elements from the next lower layer. For our purposes, we can focus on four levels of language structure: the word level, the phrase level, the clause level and the sentence level.[1] We can also identify language constructions at each of these levels, which we cleverly designate words, phrases, clauses and sentences; with phrases being made up of words, clauses being made up of phrases, and sentences being made up of clauses. Words, in this structural analysis, are the basic unanalyzable elements, while sentences are the highest-level constructions.

Now, any of these four types of constructions can be ambiguous; we can have words with two meanings,[2] phrases with two meanings, and so on. But there is a marked difference in the type of ambiguity that can exist at the word level on the one hand and at the remaining three levels on the other. Since words are (in this analysis) basic elements of language, any meaning that they have must be associated with them directly. We take care of this association by listing words and their meanings, and such a list we call a dictionary, or a lexicon. Now any word on the list that has two meanings associated with it is ambiguous, and we call this *lexical ambiguity*.

But the higher-level constructions—phrases, clauses, and sentences—derive their meaning not only from the lexical meanings of the words that compose them but also from the way in which these words are arranged. Thus, the structural pattern of the elements in each of these higher-level constructions can contribute meaning, and if this structural pattern has two semantic interpretations, two meanings, we say that the structure is ambiguous, or that we have an instance of *structural ambiguity*. Let us look in some detail at each of these types of ambiguity.

Lexical Ambiguity

I pointed out in my introduction that *ambiguous* was ambiguous. But this is no particular distinction; as a glance in any dictionary will show, most words are, in fact, ambiguous—that is, they have at least two distinct meanings. Many words are multiply ambiguous—look up *set*, for instance, or *range*, or *face*. Now, we manage to communicate pretty well in spite of all this lexical ambiguity, because in most cases context serves to sort out the proper lexical meaning—to disambiguate, as it were.

Taken completely out of context, the command:

(1) *Fetch me a plane.*

is ambiguous, but it is difficult to conceive of a communication situation where you wouldn't know whether a tool or a vehicle was desired. Similarly, the statement:

(2) *John stood by the bank.*

is ambiguous because of the lexical ambiguity of the word *bank*; but again the context of the communication situation would make it clear whether John was near a building or a river. Lexical ambiguity of this sort doesn't create much problem for the technical editor.

There are some situations in written communication where lexical ambiguity can be manipulated and taken advantage of, however. The word *brown*, for instance, has a couple of meanings: it can mean *to be of a certain color*, or as a technical term in sugar manufacturing it can refer to cane sugar that is processed in a certain way. A less than scrupulous marketer of sugar might package up a mixture of *beet* sugar and molasses and then take advantage of the lexical ambiguity and call his product "brown sugar."

Advertising gives rise to additional situations where lexical ambiguity can be used to advantage. Consider the following examples:[3]

(3a) *Scott knows a lot about people, and Scott has the papers to prove it.* (paper towels, toilet tissue, etc.)

(3b) *Woody Allen's "Bananas" is more moving than prunes.* (movie ad)

(3c) *Sears Counter Revolution.* (ad for kitchen appliances)

(3d) *Solve your pressing problems with a Westinghouse iron.*

(3e) *Time to retire.* (Fisk tires—Remember the little boy in pajamas carrying a candle and yawning?)

[1] Linguists recognize more levels of language structure than these four, but these four will suffice for purposes of this analysis.

[2] For the remainder of this paper, I will refer to ambiguous constructions as having two meanings; what I really mean, of course, is two or more meanings.

[3] I am indebted to Don L. F. Nilsen (Arizona State University, Tempe) for these examples. See Chapter Nine of his forthcoming book *Semantic Theory*.

Structural Ambiguity

Most of the ambiguity problems facing the technical editor are problems with structural ambiguity—ambiguity that arises not from the various meanings associated with words but rather from meanings associated with the patterns in which words are arranged. Let us look first at some structural problems at the phrase level.

Consider the phrase *brass screws and lockwashers* in the sentence:

(4) *Save all the brass screws and lockwashers for later use.*

The phrase can have two meanings, depending on what elements are conjoined by the *and*. It can mean *just the brass screws but all of the lockwashers*, or it can mean *just the brass parts, regardless of what they are*. The two structural patterns that represent these two semantic interpretations are shown in Fig. 1.

Another variety of this ambiguity arising from conjoined nouns is illustrated in (5).

(5) *Replace the control body and the valve or the actuating piston.*

The two possible meanings become apparent as soon as you look at the structural alternatives in Fig. 2.

Phrase-level structural ambiguity also shows up when a writer stacks prenominal modifiers in a noun phrase. Consider the underlined phrases in the following examples:

(6a) *Remove the top oil cooler guard.*

(6b) *Tighten the rear engine mounts first.*

(6c) *Check out a hydraulic piston puller from parts.*

Do we have one oil cooler with top and bottom guards? Or two coolers with one guard apiece? Example (6b) is

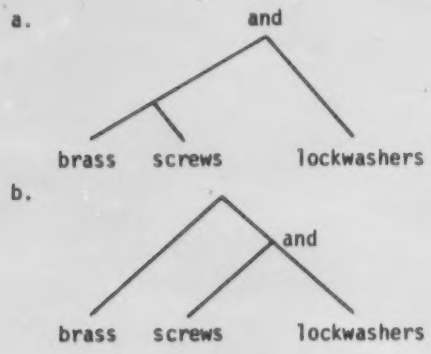

Fig. 1. Two interpretations of Example (4)

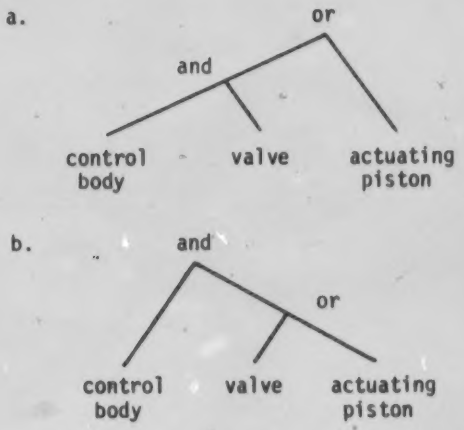

Fig. 2. Two interpretations of Example (5)

unambiguous if the machine has only one engine, but suppose you were dealing with a Caterpillar 657B Scraper—a unit that has a front engine and a rear engine? Is the desired device in (6c) a puller of hydraulic cylinder pistons or a hydraulic puller for crankshaft pistons?

These alternate semantic interpretations may not be immediately apparent just from a look at the examples, but a glance at the alternate structural patterns immediately shows the two possible meanings of each of these phrases (Fig. 3).

Clause- and sentence-level structural ambiguities can be even more of a problem. Consider the following examples:

(7a) *The police were ordered to stop drinking at midnight.*

(7b) *Flying planes can be dangerous.*

(7c) *They rolled up the rug.*

Example (7a) is actually four ways ambiguous, depending on who was doing the drinking and whether the ordering or the stopping took place at midnight. Example (7b) is also multiply ambiguous—both structurally and lexically. Consider these paraphrases:

(8a) *Flying planes can be a dangerous occupation.*

(8b) *(Low) flying planes can be dangerous to highway traffic.*

and for the second consider also the aircraft/hand-tool lexical ambiguity we noted earlier. Finally for (7c), did the rug get rolled up, or were some marbles spilled that rolled across the floor?

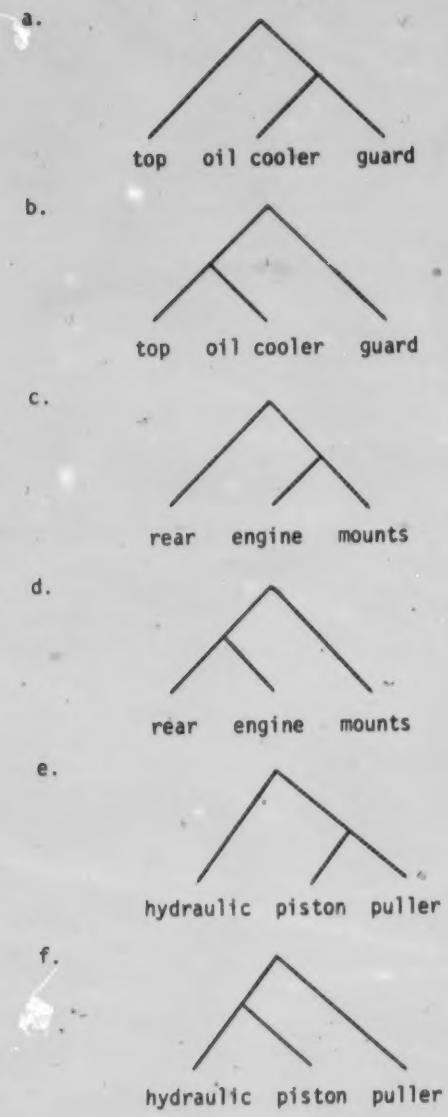

Fig. 3. Interpretations of Example (6)

Many children's riddles are based on ambiguities—both structural and lexical. One that my third-grader asked a while back is:

(9) *Q. What has four wheels and flies?*
A. A garbage truck.

This same garbage truck, I suspect, is the one that has the following sign on it:

(10) *Our business is picking up.*

Illustrating or diagramming these clause- and sentence-level structural ambiguities is somewhat more involved than doing so for phrase-level ambiguous structures. Many of them involve what linguists call deep structure relationships, and a discussion of deep structure is beyond the scope of this paper. For the reader who is interested in pursuing this subject further, however, I would suggest H. A. Gleason's *Linguistics and English Grammar* (1). In Chapter 7 Gleason suggests several alternatives for diagramming the semantic relationships that exist in various types of clauses and sentences.

The area of written communication that causes the greatest number of problems for the technical editor involves those various writing situations where, for reasons of economy, short function words are omitted from copy—situations like writing headlines, telegraph messages, and certain kinds of instructions. Consider the following examples and their paraphrases:

(11a) *Ship sails today.*
Ship the sails today.
The ship sails today.

(11b) *Old English teacher fired.*
The teacher was old.
The teacher taught Old English.

(11c) *DNR deplores shooting of hunters.*
The hunters got shot.
The hunters shot poorly.

(11d) *Loosen pelt from inside leg with skinning knife.*
Loosen the pelt from the inside leg with a skinning knife.
Loosen the pelt from the inside of the leg with a skinning knife.

Or the telegram that was allegedly sent to John Wayne's publicity agent by a writer doing a feature article on western movie stars:

(12) *HOW OLD JOHN WAYNE?*

And the agent's reply:

(13) *OLD JOHN WAYNE FINE, HOW YOU?*

Or the headline that appeared in a Midwestern newspaper a few years ago:

(14) *PIUS XI SNAPS ST. CATHERINE'S STRING*

Actually, it didn't create the furore one might think, because it appeared on the sports page, over an article describing a Catholic high school conference football game. And finally,

(15) *MARSHALL OUTLINES PLAN TO PROSTRATE EUROPE*

the headline that appeared in an Eastern newspaper in the late 40's.

Murphy's Law and the Technical Editor

Now, ambiguities of this sort, where one of the meanings is somewhat humorous and clearly not intended, can be kind of fun—or at worst rather embarrassing. But they don't seriously hinder communication. It's the everyday pedestrian sort of ambiguities that cause the problem. It's the things like *hydraulic piston puller* and *top oil cooler guard*—where the technical expert knows what he means and is totally blind to the alternative interpretation—that can cause problems for the less than totally knowledgeable reader. And it's these kinds of ambiguities that the editor must identify and straighten out for final copy to be clear and understandable. Because even if the technical expert—the writer—sees no problem, the special case of Murphy's Law applies here: If you can be misunderstood, you will be! The editor, as we know, is in a very real sense a middleman in the transaction of communicating technical information—he not only represents the technical expert to the reader, but he also represents the reader's interests; and unless he sees to it that all possible areas of misinterpretation are eliminated from the final copy, he's not doing the second half of his job.

But how does this kind of semantic analysis help the technical editor do the second half of his job? Several ways, I suggest. First of all, consideration of ambiguities—both lexical and structural, but particularly structural ambiguities—can make you more sensitive to possible misunderstandings of the copy you edit. As I suggested earlier, the pernicious ambiguity is the one where both interpretations are reasonable to the less than totally informed reader, but the writer—knowing what he is talking about—focuses on the correct meaning and is totally unaware of the other. Now if you as editor fail to recognize the ambiguity, the only one left to catch it is the reader—and he's got a 50–50 chance of guessing wrong. In fact, he may not even see the ambiguity—he may see only the wrong semantic interpretation. So sensitivity to double meaning—to ambiguity—is a useful skill for an editor to develop.

But of course just recognizing an ambiguous construction is not enough—you've got to correct the situation—disambiguate. Now, if you're one of those fortunate editors who has complete control over the final copy, you can just go ahead and make whatever changes are necessary. But if you're like most editors, you've got to run the copy back past the author for review and approval. And you've got to justify whatever changes you make. Here is where a structural analysis of ambiguity can be particularly useful: it enables you to justify your changes on grammatical grounds. By diagramming the two structural patterns that represent the alternative semantic interpretations, you can demonstrate to the author—or to anyone else—that the construction in question is indeed ambiguous. And then you can point out that the very existence of structural ambiguity is sufficient to warrant editorial change. This is a much more powerful and effective argument than merely saying to the author that he was unclear, or that although what he wrote could be understood to mean what he intended, you still found it necessary to change his copy.

Methods of Resolving Ambiguities

Let me conclude by pointing out a few methods that are useful in resolving structural ambiguities. First, let us consider phrase-level ambiguities. Often, just the insertion of a hyphen will clear up the problem. Consider the examples in (16) and the hyphenated versions in (17).

(16a) *Hydraulic piston puller*

(16b) *Front engine mounts*

(17a) *Hydraulic-piston puller*

(17b) *Hydraulic piston-puller*

(17c) *Front-engine mounts*

(17d) *Front engine-mounts*

Just remember that the hyphen indicates association—not separation. Another device that is useful with stacked prenominal modifiers is moving one or more of the modifiers to the postnominal position as a prepositional phrase, as with Examples (18) and (19).

(18a) *Top oil cooler guard*

(18b) *Old-fashioned ladies hats*

(19a) *Top guard for the oil cooler*

(19b) *Guard for the top oil cooler*

(19c) *Hats for old-fashioned ladies*

(19d) *Old-fashioned hats for ladies*

Doing this will require an extra word or two, but that's a small price to pay to avoid possible misunderstanding.

Clause-level and sentence-level structural ambiguities are a bit more complicated and usually require a complete

recasting, but even here a simple change in tense or mood or the addition of a determiner or other modifier can disambiguate.

(20) *Flying planes can be dangerous.*

(21a) *Flying planes is dangerous.*

(21b) *Flying planes are dangerous.*

Finally, the ambiguities arising from telegraphic writing style can usually be disambiguated by the insertion of a key function word—usually an article.

(22) *Ship sails today.*

(23a) *The ship sails today.*

(23b) *Ship the sails today.*

One final comment on your response as an editor to ambiguities in the copy. I've suggested some ways to resolve ambiguities, but the resolution is based on the assumption that you indeed know what the correct, or intended, interpretation should be. This, as I recall from my editing days, is not always the case. In fact, there are three possibilities: you know, you think you know, and you don't know.

Now, if you are quite sure you know what the intended interpretation of an ambiguous construction is, your best bet is to go ahead and resolve the ambiguity in favor of the correct meaning and say nothing about it. In the first place, when the author reviews your editorial handiwork, chances are that he won't even notice the change you made. After all, the copy says the same thing, doesn't it? And there's not much to be gained from pointing out that the author was ambiguous—rubbing his nose in it, so to speak—unless you're ready to launch a full-scale educational program with all your technical authors.

It's where you don't know—or don't know for sure—what the intended meaning is that things get sticky. If you just point out the ambiguity—the alternative interpretations—and then ask the author to resolve the conflict, you're going to have a fight on your hands. On the other hand, if you resolve the ambiguity yourself and guess wrong, you've got trouble, too. If the author catches your misinterpretation on review, he's going to call you seven kinds of dummy and begin to make noises that technical editors are more trouble than they're worth. It's even worse, however, if he *doesn't* catch the wrong resolution of an ambiguity, because then you wind up turning out copy that's clear—but clearly inaccurate. And nobody wants that.

So the only viable alternative in these cases is a mild argument with the author. And let me emphasize again that here's where the structural analysis of ambiguity can really help you out. By sketching out the alternative syntactic structures that underlie the ambiguous construction, you can show clearly that an ambiguity does, in fact, exist. You can then go on to point out that grammatical English does not tolerate ambiguities—for the same reasons that it doesn't tolerate dangling modifiers, pronouns without antecedents, errors in number agreement, and a host of other grammatical no-no's. In other words, you can argue that the ambiguous construction is wrong in and of itself—regardless of whether or not it might lead to misinterpretation or misunderstanding. And since you, as technical editor, are the grammar expert in the shop, the argument is usually pretty convincing.

So you can increase your effectiveness as a technical editor, then, by getting with the ambiguity program: 1) develop a sensitivity to ambiguous constructions, an ability to discern multiple interpretations; 2) familiarize yourself with methods of structural analysis of these kinds of constructions; and 3) argue against ambiguous constructions on syntactic, or grammatical grounds. If you do this, you'll soon have your boss saying, "I can't recommend this editor too highly. . . ."

Reference

1. H. A. Gleason, *Linguistics and English Grammar* (New York: Holt, Rinehart and Winston, Inc.), 1965.

From PROCEEDINGS, 1967

Stalking the Trouble-Some Hyphen

Maxine Heffner

In the family of punctuation marks, the hyphen probably suffers most at the hands of the technical writer. More and more frequently we see this small and useful sign as the vagrant—the idle wanderer with no place to call its own. Ubiquitous, it is sprinkled throughout all kinds of documents like hen tracks in a dusty barnyard—and often is just as meaningless. Or it is scorned completely and found missing from even those spots which cry out for it. This trend for the hyphen to be used capriciously by all but the most perspicuous writers deserves confrontation and reversal. For when the hyphen is properly used it becomes invisible and promotes clarity; but when misused, it perverts sense into nonsense. Because it is to be wondered if this cavalier treatment of the hyphen stems from the technical writer's not having come to grips with it since his early school days, this paper presents a brief review of the hyphen and its correct use.

Introduction

Some technical writers seem to forget that the purpose of technical writing is the same as that for all other kinds of writing—to get an idea from one mind into another, clearly and speedily. Good punctuation aids this transfer of thought; poor punctuation hinders it. More and more frequently, this rudiment seems to have been forgotten—if it was ever learned—by many so-called "professionals."

Granted that modern technical writing deals constantly with lengthy and involved thought units, it is possible to set them forth clearly if one makes proper use of punctuation marks. For promoting lucidity and preventing the reader from getting lost amidst a string of modifiers, there is no more useful device than the hyphen. For example, in a brochure we were editing recently, we encountered the phrase "training needs analysis." We were surprised to learn at review time that the author did not mean that the training needed analysis; he meant that there existed a requirement for analysis of the training needs. He would not allow us to rewrite the sentence but acquiesced easily to "training-needs analysis"—and once again clarity had triumphed over ambiguity with the aid of the little sense-making hyphen.

The Need for Joining

Even experienced writers sometimes need reminding that the hyphen is not merely an ornament; nor is it just a short dash. The dash is a separator; the hyphen is a joiner! In fact, the hyphen's sole role in the punctuation scheme

of the English language is to join two or more words—either temporarily or permanently. This requirement must be present to justify the hyphen's use in every instance: "...no technicalities are necessary...common sense is all that is wanted."[1] *Necessity* for tying together for the sake of clarity should be the only guide when doubt exists.

A hyphen should never be used between two words that do not need uniting—that can do their communications job just as well if left standing separately. Conversely, a hyphen should always be used when its absence might lead to ambiguity. Specifically, a hyphen should always be used to join two or more words which are to serve as one adjective, noun, or other part of speech (microwave-excited particles, Lyman-Jones invention, mass-circulation dailies). Furthermore, a hyphen should be used to show that two (or more) adjectives, each of which could be applied separately to the noun, are not so meant but are to form one word conveying a compound idea ("a red hot stove," i.e., a stove that is both red in color and hot; "a red-hot stove," i.e., a stove so hot that it has turned red).

Even those end-of-the-line hyphens, which are more the responsibility of the typist than of the editor, are joiners. No one ever fails to hyphenate here because the need for joining is obvious.

Hyphens sometimes do their joining job so well that with time and usage they wear out their own need and forever seal together two or more words (to-night, tonight; co-ordinate, coordinate). It is interesting to speculate how long it will take for the "as" which follows the three-word compound "insofar" to be joined to its helpers—as peculiar as it may look (insofaras).

Some Do's and Don'ts

Although "authorities" differ as to which compounds should be written solid, which separately, and which hyphenated, the following brief review represents the trend of the best usage.

DO use a hyphen when omitting the "and" between separate nouns used singularly (secretary-treasurer, fighter-bomber, city-state).

DO use a hyphen to form a compound (unit modifier) adjective (low-altitude flight, high-pressure chamber, third-stage vehicle, 85-degree heat, 3-foot fence, nine-dollar tickets, full-bodied wine). Note, however, that through usage many compound adjectives, especially those with only a derived or figurative sense, have come to be written solid: for example, stouthearted, crackbrained, bullheaded.

DO use a hyphen to form a compound adjective consisting of an adverb not ending in "ly" plus a present or past participle (hard-working, slow-paying). Do not use a hyphen with an "ly" adverb (quietly spoken hint, loudly shouted warning).

DO use a hyphen to join an adjective and a participle (sinister-looking man, long-running feud).

DO use one hyphen, but not two, to join compound numerals (thirty-two, thirty-three hundred). Also, when the fraction in a mixed number is typed with a virgule (/), DO join the fraction and the whole number with a hyphen (8-1/2). When a fraction is a unit modifier, DO hyphenate (a three-fourth's majority); but when it precedes a prepositional phrase, do NOT hyphenate (three fourths of those absent).

DO use a hyphen to join multiple-word terms that immediately precede the word modified (three-to-one ratio, magnitude-versus-frequency relationship, face-to-face interview).

DO use a hyphen to form a compound adjective when the first word modifies the second (bluish-gray fabric, wide-open door, well-designed tools). When these terms are used predicatively, however, they are not hyphenated (the door was wide open, the tools are well designed).

DO use a hyphen to join the modifiers when a noun stands as an object of a following present participle (life-giving blood, gum-chewing children).

DO use a hyphen to join a participle and an adverb not ending in "ly" (broken-down machinery, burnt-out bulbs).

EXCEPTION: Compound modifiers consisting of a two-word proper noun are not hyphenated (New Testament era, New York rivers), unless they are two personal proper nouns (Gauss-Planck constant).

DO use a hyphen in most compound adverbs (to strike head-on, well-nigh useless, to throw baseball-fashion).

DO use a hyphen to form a compound verb of an adjective and a verb (cold-chisel, double-track, diffusion-bond). However, most compound verbs formed with prefixes are solid (pretend, underscore, overcome).

[1] Fowler, H. W. *Modern English Usage*. London: Oxford University Press (1965).

DO use a hyphen for suspensive effect (first-, second-, and third-stage firings; six- or eight-cylinder automobile).

DO use a hyphen for terms consisting of a capital letter and a noun when they are used as attributive adjectives (I-beam rafter, T-square measurement, X-ray tube). Do not use a hyphen when the terms stand as nouns (the man bought four I beams, the X ray was most revealing).

DO use a hyphen to make verbs and prepositions into nouns and adjectives (cut-in, go-between). Note, however, that from usage many such words often lose the individual accent on the second element and become solid compounds (setup, layout). When in doubt (and it is wise to be doubtful in these instances), consult a recent dictionary to see if the compound word has achieved this closed-up status.

DON'T use a hyphen in a unit modifier containing a letter or numeral as its second element (Phase II modification, Site B location, Building 3 entrance).

DON'T use a hyphen in a unit modifier enclosed in quotation marks unless the hyphen would be necessary without the quotation marks ("good neighbor" policy, "blue sky" law, "tie-in" sale).

DO use a hyphen to join prefixes to words beginning with a capital letter (un-American, pro-European, anti-English).

DO use a hyphen to join impromptu combinations (clickety-clack, flip-flop, tick-tock).

DO use a hyphen when the first word is "self" (self-made, self-addressed, self-starter).

DO use a hyphen to prevent mispronunciation or ambiguity (bell-like; recreation and re-creation, retreat and re-treat; reform and re-form).

DO use a hyphen to join duplicated prefixes (sub-subcommittee, post-postscript).

DO use a hyphen to form compound nouns made by adding "er" to a verb, plus an adverb (hanger-on, listener-in).

DO use a hyphen in compound nouns naming a technical unit of measurement (light-year, horsepower-hour, foot-pound).

DO use a hyphen in most compound nouns consisting of a possessive case and a noun (cat's-paw, bull's-eye).

DO use a hyphen after "ex" when "former" is meant (ex-governor).

DO use a hyphen before "type" and "shape" and "shaped" when they modify a noun (executive-type mind, jet-type engine, U-shaped wire, box-shaped room).

DO use a hyphen, usually, before and after "proof" (it was proof-tested, it was explosion-proof) but note "waterproof," "foolproof," and "proofreader."

DO use a hyphen when identical vowels would otherwise come together, except one-syllable prefixes ending in "e" or "o" (multi-investment, tri-industrial, cooperation, reentry[2]).

Finally, DO approach the hyphen *nec temere nec timide*—neither rashly nor timidly—and this little oft-abused mark will improve your written communications—technical or otherwise.

[A list of more than 1500 troublesome compound words is appended to this paper in the 1967 Proceedings.]

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[2]This usage is not recognized by most dictionaries, and many authorities prefer "re-entry." We believe "reentry" is justified because of the change in the pronunciation of the second "e." On the other hand, we would hyphenate a word like "re-elucidate" because both "e"'s are pronounced the same and because the hyphen is needed to prevent the diphthong sound.

From TECHNICAL COMMUNICATIONS, Second Quarter, 1969

Editing by Dialogue

Nelson A. Briggs

Israeli philosopher Martin Buber draws a distinction between the **I-thou** *and the* **I-it** *which can be extended to the world of technical communications. Editing by dialogue is to the I-thou what editing by fiat is to the I-it. Under certain circumstances hard-nosed editing may be necessary, but it has no place in situations demanding a happy interface between editors and engineers. This article, which explores the obstacles as well as aids to dialogue in the editing function, is based on a paper presented by the author at the STWP First International Technical Communications Symposium, Tel Aviv, Israel, Dec. 9–12, 1968.*

According to Israeli philosopher Martin Buber, dialogue depends on a sharp distinction between our knowledge of "things" and our knowledge of "persons." Things are known impersonally, as objects which exist beyond us and are impenetrable by us. But we do not know other persons with whom we are intimate in this way—we meet and address them, they live in us and we in them.[1] The relationship between a person and a thing is what Buber calls an *I–it* relation. It is impersonal and properly speaking is not a relationship at all. The relationship between persons is what Buber calls an *I–thou* relationship, the thou being another, treated as a person rather than a thing. It is the basis of all dialogue.*

On this account, dialogue is not merely a verbal transaction. If conversation offers the most common example of dialogue, it is by no means the sum and substance. Anyone who, in the drag of the day, has looked up from his desk, and across the office, and met the eyes of another in a moment of mutual recognition and human understanding knows what Buber was driving at when he said that in such situations words need not accompany dialogue for it to be authentic. Neither is dialogue rapport. Though easily confused, the two are in fact quite distinct, as I shall explain later.

Buber's mind was on higher things. His concept of dialogue was richer and profounder than anything I can do justice to here. But much of what he had to say applies in the netherworld of technical publications. Buber has said that "All real living is meeting," which I would paraphrase, for our purposes, to "All real editing is meeting." In the discussion that follows, editing by fiat exemplifies the I–it relation; editing by dialogue, the I–thou.

* In Buber's version, there is also a sense in which dialogue is possible between a person and a thing, as in the Zen-like symbiosis which obtains between a motorcyclist and his machine.

Editing by Fiat

In the October 1961 issue of the *STWP Review*, Robertson Osborne said "The editor represents an objective, independent point of view, and a fundamental part of his job is to put himself in the place of the intended reader." A. A. Farkas, writing in the December 1964 issue of IEEE's *Transactions on Engineering Writing and Speech*, considered editing to be "nothing more" than assuming the role of the reader, examining the paper critically and making all the necessary changes. Ruthlessness, in his opinion, was essential. Statements of this kind are not unusual. They illustrate a commonly held view of editing. They emphasize the editor as ideal observer, audience-oriented critic, merciless examiner of the written word. But in portraying the editor in this manner, these preconceptions do so only at the expense of alienating him from the technical author. Once permitted to become cramping ideas, they can cause a great deal of trouble for a technical publications group. To conceive of the editor as some kind of ideal observer, omniscient in matters of written communications, and responsible for legislating the rights and wrongs of a paper on behalf of "the audience" is to view him as a kind of underworld deity entitled to lay down publications law by fiat. To conceive of the editorial function in this manner is to license any sadistic instincts which editors may have.†

Indeed, I have sometimes thought that to be a good editor one needed more than just a dash of sadism in his makeup. Though not as sure of this as I once was, I still think there are plenty of editors not altogether lacking in the quality. I've known at least a few who attack a manuscript as if they were mugging some unsuspecting soul in a dark, deserted alley. They chop at it here, cut at it there, thoroughly knock the everlasting wind out of its sentences. After giving it a swift kick between the paragraphs, they leave it supine and enfeebled—dripping the blood-red color of an editorial pencil.

This is editing by fiat. It reflects an authoritarian disdain for the identification of an author with his manuscript. The editor-by-fiat, in his concern with the paper, forgets about the person. He is dominated by four cramping ideas: the idea of reviewing a *document*; the idea of *correcting* the document; the idea of keeping the *audience* in mind‡; the idea of editorial *rigor*. His tack: what the military calls "by-the-book."

† I don't mean to attribute this conception to either Osborne or Farkas, but merely point out that (in the hands of the wrong editors) their commonly held point of view can degenerate into this sort of thing.

Of course, certain publications departments, particularly those in the technical manual industry, may find that to some extent editing by fiat is necessary, even mandatory. Technical manual writers may not possess a particularly good command of language; they may not be as familiar as they should with the details of the governing specifications and standards; they may give short shrift to specifications and standards which they don't consider "reasonable." Under such conditions, some degree of tough-minded editorial backup may be necessary since rejection of a manual for reasons of inadequacy, inaccuracy, or failure to comply with the governing specifications may result in severe financial loss, and ultimately the editor's head.

Also, military specifications and standards have a way of depersonalizing a writing effort, gearing communication to a tenth grade level or below, and toughening up an editing effort. Accordingly, it is natural that many technical manual writers join with the plain-talk experts in thinking "that the only alternative to gobbledygook is lower-school English." They know full well that considerable time and money can go down the drain when a job has to be reworked. If, however, editing by fiat is necessary in certain circumstances, this does not mean the editor has no room for flexibility. And while the editorial operation may be oriented to the requirements of the customer rather than the desires of the writer, the editor need not refrain from negotiating with the customer's inspectors on behalf of the writer's needs. Perhaps, rather than "editing by fiat," the kind of editing just described might be more appropriately called "editing for buy-off."

There are, however, situations in which editing by fiat is clearly wrong-headed. For example, editing by fiat has no place in a research and development company if a happy interface is to be achieved between editors and technical authors. The publications staff in such companies must gear its services to the *needs* of the technical staff. The needs of the technical staff author may not always be consistent with those of the audience. Also, identification of the technical author with his paper is closer than that between the technical manual writer and his manual. Since conflicts between editors and technical authors can be detrimental to the operational effectiveness of a publications group, it is more to the point to conceive of editing in such companies as editing by dialogue.

‡ Some might find in the word *audience* a connotation of the personal. While probably true, I think that most editors treat "audience" pretty much as an impersonal concept, using it as an umbrella for such things as "level of education" and "kind of experience." From this point of view, the audience is not so much a collection of persons as of statistics.

Editing by Dialogue

Editing by dialogue recognizes that one of the stickiest areas in technical publications is that of interpersonal relations. As Buber says of the relation of doctor and patient, so also one might say of the relation of editor and author: "It is essential that this should be a real human relation experienced with the spirit by the one who is addressed; but as soon as the helper is touched by the desire—in however subtle a form—to dominate or to enjoy his patient, or to treat the latter's wish to be dominated or enjoyed by him other than as a wrong condition needing to be cured, the danger of falsification arises, beside which all quackery appears peripheral."[2]

Editing by dialogue has special relevance for the publications group that is established to provide "service on request." Continued existence of such groups depends largely on the extent to which the technical staff is satisfied with the services provided. Editing by dialogue is an excellent means of "tribalizing"[3] the relationship between editors and engineers. In some situations (for example, if Publications is in the administrative directorate and Engineering in the technical) it may be the *only* means.

What, then, is editing by dialogue? Earlier I noted that four concerns, when they become overriding, can drive an individual into editing by fiat: document, corrections, audience, and editorial rigor. In contrast, editing by dialogue is concerned with a *person* (not a piece of paper); with *subject matter* (the audience emerges only as a secondary consideration); with *improvements* (rather than corrections); and with the *mutuality* of editor and author (rather than the domination of one by the other). For the editor-by-dialogue, if everything is not lawful, it is at least negotiable.

The editor-by-dialogue is acutely aware that whenever he reviews a manuscript he comes into contact with a *person*—not just a piece of paper. He keeps the author in mind as primary; is concerned with the audience only insofar as its needs are consistent with the purposes of the author; is knowledgeable in the principles of good writing but not bound by "rules." Unlike the editor-by-fiat, his is not a "by-the-book" approach. He recognizes that slavish adherence to rules can sometimes play hob with the natural style of an author, resulting in a formally correct but lackluster document. He recognizes that, under certain conditions, statements may be grammatically incomplete, infinitives split, and sentences ended with a preposition or started with a conjunction. He recognizes that the author may have actually intended certain types of ambiguity. He recognizes that, in case of incompatibility between a "fog index" and an author's style, it is not always desirable that the author's style should go.[4] He recognizes, in short, that "corrections" may not be synonymous with "improvements." Consequently, any substantive changes to a paper are accomplished in close, interpersonal review sessions with the author. It is a tutorial rather than a lecture system—with something to be learned on both sides. The situation is one of intersubjective "feedback" in which an increasing degree of confirmation is achieved between editor and author. Dialogue rather than monologue structures the situation.

Dialogue Is Not Rapport

From time to time, one hears talk in technical publications about the importance of "rapport." The word is thrown about loosely, with few stopping to consider its full meaning and significance. Since some may tend to confuse dialogue with rapport, it is necessary to point out that the two words represent entirely different conceptions.

While it is true that dialogue may contain rapport as an element, rapport does not necessarily entail dialogue. There is in fact something almost monological about rapport, pertaining, as it does, not so much to interaction as to unanimity. In ordinary language it means "being in tune with another," "hitting it off together," "seeing eye-to-eye." Though the gap between persons is bridged, there is a tendency for rapport to smother the "otherness" of the individual (both editor and author) in a kind of togetherness. The commonality of two lovers probably exemplifies the height of rapport as much as anything else. The fact that rapport can also entail an unhealthy—even poisonous—quality is all too evident, as, for example, in the supposedly mystical spirit of the *volk* which was thought to permeate the mass-minded ethos of Germany during the 1930's.

Dialogue tends to preserve otherness. Rapport seems to smack of that which is blind, passive, static, even suffocating, while dialogue as construed by Buber is a dynamic, interacting, confirming relationship, a happening between persons without any loss of individuality. It is confirming but open-eyed, in the sense of "confirming one's partner...even as one opposes him."[5] As such, dialogue presupposes neither unanimity nor loss of effective identity.

I said there was something monological about rapport. Perhaps it would be better to say narcissistic. Rapport, unlike dialogue, seems to be a matter of experiencing the

same side rather than the *other* side. It is a "tuning in" rather than a "turning toward." Confirmation of this distinction may be found in the dictionary definition of rapport as a "relation marked by harmony, conformity, accord, or affinity."[6] No connotation of healthy opposition here!

In other words, though in dialogue editor and author confront each other as limiting factors, they do so in an openhearted spirit. The experience is one of overcoming—as individuals together; the result, optimum acceptable improvement of the manuscript. This is what Buber means when he says, "Each must expose himself wholly, in a real way, in his humanly unavoidable partiality, and thereby experience himself in a real way as limited by the other, so that the two suffer together the destiny of our conditioned nature and meet one another in it."[6] On this view, dialogue is fulfilled when the *de facto* situation between editors and authors is transformed into a bond between author and editor. "Opinions are gone; in a bodily way the factual takes place."[7]

Obstacles to Dialogue

Apart from the pitfalls of authoritarianism, and the tendency to confuse dialogue with rapport, certain other obstacles stand in the way of editing by dialogue. Each represents a specific form of monologue.

First is that terribly oversimplified (and, in technical publications, vastly overrated) version of the Shannon–Weaver theory of communications. This is the model that construes the communications process in terms of a transmitter and receiver, connected by some electromechanical means, usually a "noise bed." Adequate enough to represent the writer–audience relation, it is not particularly appropriate to the editor–author relationship. The model represents one-way monological processes that pertain to communications between things—not persons. The complexities of interpersonal communication call for a richer and more dynamic model, probably for a plurality of models.

Second, there is a tendency to confuse diplomacy with dialogue. Diplomacy frequently comes across as a contrived, manipulatory technique, based on ulterior motives—either the motives of the diplomat himself or those of the cause he serves. As such, the diplomat is often concerned with persons only insofar as they are means to ends. If successful, he accomplishes his objectives, which are not necessarily those most to be desired; if not successful, he may wind up either sandbagging the job or abjectly appeasing the other. Genuine dialogue, on the other hand, involves a direct, open-faced, person-to-person relationship. Without a foundation in dialogue, diplomacy is monologue clothed in the garments of the tartuffian.

Third, a kind of publications fatalism can set in, the sort of thing that assumes engineers are inherently incapable of publications support. Such thumbs-down statements as "engineers will always be the way they are," "engineers will never learn to write," or "engineers are a bunch of prima donnas who don't know the difference between good communications and bad" are attitudes that destroy the possibility of dialogue, leaving only two doors open: either abject submission to the dominant will of the technical staff or a tooth-and-nail fight to make the technical staff take its publications medicine.

Finally, as a fallout from the preceding, there is a kind of *one-upmanship* which sometimes develops in exchanges between editors and engineers as things degenerate into a debate. And a debate, whether great or small, is nothing but an exchange of monologues in which two people try to outdo each other. Also, as implied in the discussion of diplomacy, the reverse is a kind of downundership in which the editor is constantly back-pedaling in his relations with engineers. Editing by dialogue, concerned as it is with the mutuality of editor and author, is not back-pedaling, for at that level dialogue is hardly more than that which transpires between ventriloquist and dummy.

As Maurice Friedman has said in clarifying Buber's theses: "The monological man is not aware of the 'otherness' of the other.... The basic movement of the life of monologue is not egotism but the withdrawal from accepting the other person in his particularity in favour of letting him exist only as one's own experience, only as a part of oneself."[8] But the editor-by-fiat, the diplomat, the fatalist, the debater, the back-pedaler—all of the types just described—are monological types, found in nearly every large technical publications department.

Aids to Dialogue

Dialogue as something of value is not easily contrived. Perhaps it cannot be prescribed for at all. Hence the following observations (some old, some not so old) probably ought to be regarded as characteristics rather than prescriptions for promoting dialogue between editors and authors:

First, a truism, but one certainly worth repeating: the need for genuine interest, not only in the author but particularly in his work. As Emerson Clarke puts it, "The

finest compliment one professional can pay another is to show interest in his work."[9]

Second, an old one: the virtue of a neat, clean job of editing. A scrawly, scribbly mess is not only difficult to decipher but gives the impression that the editor has butchered the author wantonly.

Third, another old one but still good: avoidance of subjective changes. A change which cannot be justified or clarified on objective grounds is probably best forgotten. If no rationally acceptable means of resolving a question is available, the editor should find it no great defeat to go along with the author's "feeling" rather than impose his own.

Fourth, the need to keep in mind the difference between corrections and improvements: only minor corrections should be made to a manuscript (e.g., spelling, grammar, and punctuation). Corrections of a substantive nature (syntax, organization, ambiguity, etc.) are best questioned in the margin of the manuscript, with the suggested improvements worked out on a separate piece of paper and developed or discarded in later review sessions with the author.

Fifth, use of a red pencil in correcting manuscripts can be disastrous. A correction in red can affect the sensitive author like a gash from which he finds his blood is dripping. The cool, blue pencil, or the calm, grey pencil, is preferable to the hot, bloody pencil.

Sixth, it is a wise editor who avoids becoming a mountain for Mohammed. The habit of always expecting the author to come to the editor can create the impression of "lording it over the author."

Seventh, though knowledge of the principles and rules of language is requisite, it is not necessary to be a "by-the-book" editor. Authors may have perfectly acceptable reasons (convention, tone, "politics," etc.) for violating what's in the book. A good editor is not a hard-nosed grammarian.

Eighth, in discussing edited material, the thoughtful editor reminds the author of other things which he may have forgotten or overlooked, such as the need to obtain public dissemination clearances or department approvals. Small courtesies of this sort sometimes mean the difference between friendship and a strictly business relationship. And, of course, they also expedite the job.

Ninth, books like Richard Fear's *The Evaluation Interview* (McGraw-Hill, 1958) and Norman Haughness' recent article in *Technical Communications*[10] can be helpful for the perspective they provide. Even books written principally for employment interviewers contain much of value for the editor concerned with improving the effectiveness of his interpersonal relations. However, mechanical implementation of such "guides" may cause one to travel the path of the diplomat.

Tenth, an editing–engineering relationship entered into without confidence in one's knowledge of publications and without respect for one's own abilities affords little ground for dialogue. However, while self-confidence and self-respect are not synonymous with "kow-towing," neither are they inconsistent with humility.

Once again, such aids are best viewed as possible characteristics of dialogue. Dialogue does not consist of them. The life of dialogue cannot be translated into a theorem or a program. Any attempt to contrive an effective interpersonal relationship by the imposition of these or other "aids" can rapidly degenerate into the way of the seducer, which in point of departure, itinerary, and ultimate destination is monological throughout. As Buber puts it, "There is no ordering of dialogue. It is not that you *are* to answer but that you *are able*." Any "how to" approach to the life of dialogue amounts to a public confession of misunderstanding–and inevitably must fall short of its mark.

Epilogue

Just as a person does not acquire true charm in a charm school, neither can one expect to learn dialogue in an article like this. Editing by dialogue involves editors and engineers in the interpersonal relationship which Martin Buber explains as the I–thou. It requires an element of openness, but necessitates neither "hard nose" nor "sweet talk." Though one can discuss aids to dialogue, it is a relationship to be explored, not manufactured or contrived. Attempts to impose dialogue on a situation will probably lead to monologue. Certainly, dialogue is a "happening" which, when it does happen, is assuredly the most effective means of bridging the gap between editor and engineer.

In Buber's own words, "The life of dialogue is no privilege of intellectual activity like dialectic. It does not begin in the upper story of humanity. It begins no higher than where humanity begins. There are no gifted and ungifted here, only those who give themselves and those who withhold themselves. And he who gives himself tomorrow is not noted today; even he himself does not know that he has it in himself, that we have it in ourselves; he will just find it, 'and finding it be amazed.'"[11] As such, editing by dialogue is editing in depth.

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The Art of Editing

Eva P. Dukes

A decision-making process, editing must take into account both objective and subjective factors. The latter means that the interaction between editor and author is most important, and an understanding of human factors is vital. This article suggests practical approaches that the editor may take to ensure a fruitful interchange of ideas with the author.

Editing is not only a combination of skills: it is also an art. In addition to the usual linguistic, literary, and other professional training required for general editing, technical editing demands competence in science or technology. The degree of competence may vary with the level of editing. Since those basic technical skills have often been discussed elsewhere, they are taken for granted in this article. The remarks that follow apply to all kinds of editing.

The art of editing is more difficult to define than is any specific skill. It embraces intangibles as diverse as are the requirements of applying logic and common sense to any number of dissimilar manuscripts; of using tact in dealing with the varied personalities of different authors; and of exercising good judgment and flexibility in confronting both an author and his work. This is true for all levels and types of editing. Essentially it involves an understanding of the human factors that play so great a part in making the editorial dialog either succeed or fail. This art is more than a collection of techniques: it is an interaction with another person that depends to some extent on the total personalities of the participants. In this sense the art is as elusive as the personality of each of its practitioners, and in this sense it cannot be taught.

In practice, however, it is worth noting that a minor error in judgment is seldom "fatal" and that even major mistakes are sometimes reversible. As in all important areas of human relationships—such as marriage, child rearing, or educational training—individual incidents of good or poor judgment are not decisive: the content and tenor of the total dialog are. Nevertheless, as the editorial dialog is a more transitory and superficial relationship than, for instance, a family situation, there is less margin for error.

Experts may disagree as to which individual actions are "right" and which "wrong" under a given set of circumstances. Yet all would agree that a healthful emotional climate—whatever that may be—is desirable. An analysis of certain recurring factors in the editorial constellation may therefore be useful in considering alternate methods of approach.

Courtesy

It would appear superfluous to point out that courtesy is an essential lubricant against interpersonal friction, were it not for the fact that we sometimes get angry without fully realizing that we do. But emotions have a way of communicating themselves so subtly on paper or in speech that we may overlook their manifestations in our utterances. The reader's or listener's antennae are equally sensitive and will register faint signals, at least subliminally. A negative charge is thereby set up that is likely to do even greater damage than if it were openly perceived. An undercurrent of ill feeling may trigger unpredictable negative responses that will serve to perpetuate a chain of mutually undesirable reactions.

According to one of my favorite old sayings, "A gentleman is someone who is never unintentionally rude."* By forcing us to face up to our feelings, this maxim gives us an opportunity to weigh the consequences of expressing ourselves more harshly than necessary.

An awareness of courtesy is important to instill also in the people who share your author contacts even to a limited extent. If someone in your organization insults one of your authors through unconscious rudeness, the unaware offender is not likely to give you fair warning. Thus you may never know what hit you the next time that author take a figurative swipe at you.

Telephone or Letter?

In comparing the relative merits of the spoken versus the written word, the main factors are:

1. Efficacy—the most difficult one to measure directly.
2. Efficiency—time saved in various ways (including the speed with which a request for action may be followed up).
3. Cost.

These objective determinants, however, are affected also by subjective components of the system, such as whether the author in question normally appreciates or resents being called; and whether you yourself would rather talk or write (a) to people in general, (b) to a particular author, (c) at a given time.

Moods, including your own, may influence results. Avoid confrontations when you are not emotionally prepared—obviously you should be factually prepared. Listen not only to the words but to the tone of voice at the other end of the wire. If the voice sounds harassed, ask if you may call at another time, or whether the person would rather call you. If the moment is not propitious for a lengthy conversation, make a telephone appointment. Unless your needs are so urgent as to brook no delay, you might make a second appointment rather than wear out your welcome.

Often the reason for using the telephone determines the efficacy of a call. Thus if you intend to procure a manuscript from an author with whom you are not yet personally acquainted, a call might be expected to produce more good will, convey more information, and establish rapport more effectively than might a first letter. The author, however, may ask for written confirmation before making a final decision. But if the first contact is in writing, this first letter may have to be more detailed than a mere confirmation or follow-up. In that case, the author calls or writes for further details.

According to the Dartnell Corporation,[2] the cost of an average business letter has almost tripled in the last 20 years, from $1.17 in 1953 to $3.31 in 1973. The length of such an average letter was considered to be 250 words in 1953, but only 120 words in 1973. Dictating time, then and now, was estimated at 7 minutes. Secretarial time (sometimes including filing) has apparently decreased from 20 to 18 minutes. Many other factors, including overhead, materials and mailing costs, and lost motion were taken into account.

The 1973 average is based on a weekly salary of $250 ($13,000 per year) for the person who dictates and $132 ($6864 per year) for the secretary-stenographer. A significant increase in one or both of these two factors alone—not to mention rents in a city like New York as compared to the national average—would raise the cost per letter considerably. No wonder, then, that William S. Barnard,[3,4] of International Business Machines Corporation, cites a cost of $4 to $9 for the average business letter (215 words). The frame of reference of the study referred to by Mr. Barnard includes the following assumptions: one error in dictation, two erasures, no editing or revision, and two carbon copies.

The range of remedies proposed for lowering this expense extends from the first suggestions for establishing a centralized department for dictation and typing to recent developments toward the use of word-processing systems. If you consider, in addition to all of the foregoing,

* Although I have been unable to track down the author of this quote in the exact form cited, the version I have long remembered and preferred, I did hear Arthur Treacher, on television,[1] attribute to Oscar Wilde: "No gentleman is rude accidentally."

the higher costs of a lengthy letter that contains detailed editorial suggestions and perhaps difficult technical terms, you may doubly appreciate the conclusion reported by *Nation's Business*[5] in 1970: "Try dictating equipment—or the phone."

Obviously, the average phone call over a short distance costs less than the average letter. Yet there may be reasons for writing a letter, regardless of cost. One is, of course, self-protection: for instance, to prove that the author was advised of his deadline, or the cost of alterations in galleys. Another is the need for recording complex subject matter or permissions. Furthermore, copies of a letter can be used to inform many people simultaneously or subsequently. To achieve similar results by use of the telephone, you would have to make a conference call or tape your conversation. Besides, a letter can be written at one's own convenience and held to any desired length. By contrast, the partial loss of control over time constitutes one of the hidden costs of using the telephone.

Some telephone calls cost less if they are made by a secretary or assistant (assuming that you have either or both). When you want to speak yourself, you may let this person make the connection, as time is too often lost in the process. Remember that the rate structure is based not only on the time spent talking and the distance called, but also on the time of day. If you expect your call to be expensive, you may agree with your author beforehand to call him or her after business hours, when lower rates prevail, especially if the time lag between your respective locations makes a later hour more convenient for the author. Should you call from your home, you may instruct the operator to charge the call to your company billing number. This practice depends, among other things, on your enjoying the trust of your company.

When the cost of a phone call exceeds the cost of a letter, considerations of urgency may become decisive. If you must have the information right away, you have no choice. If you have some leeway, and your questions are involved or cannot be answered on the spot, write first and announce when you are planning to call. (This also gives your author time to dispel any initial reactions that may be defensive.) You may also ask your author to call you collect. Some authors will call you long distance at their own expense but appreciate being offered this courtesy. Another time you must call is when an author does not answer your letters or even a wire. But then you must also confirm your conversation in writing.

As to efficacy, when time is short, the telephone is especially helpful when you have a large number of minor and major questions to settle, say, in the case of a manuscript that was submitted late. Some questions overlap—the answer to one may determine if the next need be asked, or how it should be phrased—and to present these in a letter, even with the aid of an enclosed annotated copy of the manuscript, may require a ridiculous amount of verbiage. (In writing, questions of this type tend to make you, the editor, look less than intelligent, an impression you are not eager to convey, unless it serves a good purpose. The spoken word is more flexible in this respect, as it is in others.)

Last, do not overlook hidden costs. Some telephone conversations are so involved, important, or both, that you may have to record them in "a memo for file." You may even want to send your author (or consultant) a copy, and thus end up with the cost of a lengthy long-distance call plus that of a lengthy letter. But there are times when this procedure is justified. If you are lucky, you may get your telephone partner to write the confirming letter—this game, too, has its champions.

The Manuscript

Editorial views and practices vary widely regarding the methods by which queries and suggestions may be conveyed to the author in writing. Nelson Briggs[6] believes in "...a neat, clean job of editing. A scrawly, scribbly mess...gives the impression that the editor has butchered the author wantonly." His attention to detail includes even a choice of color: he prefers "the cool, blue pencil, or the calm, gray pencil...to the hot, bloody pencil." He would make only minor corrections (spelling, grammar, punctuation) on a manuscript. "Corrections of a substantive nature (syntax, organization, ambiguity, etc.) are best questioned in the margin of the manuscript, with the suggested improvements worked out on a separate piece of paper and developed or discarded in later review sessions with the author."

Gerard Piel, publisher of *Scientific American*, in accepting the fifth Archives of Science Award (1969), recalled that the first was awarded to Warren Weaver, who "shared with us the secret of his success in this delicate operation on a long succession of strong egos." (The "operation" was the editing of brief radio talks to be given by distinguished scientists. An even more difficult operation, one might add, is one that involves weak egos.) Quoth Weaver: "When you get through rewriting his copy, send it to him in a clean new manuscript—never his original with your changes marked all over it....But you

must assure him that the story is, of course, his very own and that he is free to rewrite the whole thing if he insists!" "After 21 years," said Piel, "we can testify to Warren's wisdom. We haven't lost an author yet."

One need not follow blindly the advice of these prominent editors, but one might find it helpful to abide by the spirit of their suggestions. Retyping an entire manuscript has many disadvantages:

1. It is expensive and time-consuming.
2. It may introduce new errors and thus requires careful proofreading.
3. It makes it more difficult for the author to determine what has been changed and why.

Some authors are as conscientious and curious as are editors and would like to be able to evaluate changes at a glance, without painstaking word-by-word comparisons. For similar reasons, many editors rarely appreciate receiving a completely retyped manuscript in response to a few suggestions. Such a manuscript shows the author's good intentions, but it more than doubles the editor's task of checking and comparing: checking for new errors—in old as well as new copy—and for the new material so that it might be edited and styled. That is why many of us prefer to retype only the "foulest" copy or suggested inserts, and why we prefer our authors to do the same. If retyping is absolutely necessary, it should be done after answers to queries have been received and evaluated. Although the retyping may then have to be done in the publisher's office, this expense is far more bearable than the forced duplication of editorial work.

Asking Questions

Never be afraid to question a word or a passage that does not make sense to you. If you cannot find out on your own what it means, ask your author. Do not be put off the trail by this standard initial response: "Any child would understand that...you know very well what I mean...." Above all, do not fear to appear foolish: if you do appear so (not too often), it may ultimately work to your advantage, by making the author less resentful of your exposure of his (or her) frailties. More often than not, however, your self-confidence will pay off: you may uncover an error that went undetected through half a dozen printings (past less conscientious or more timid editors), or you may help clarify a passage that even the author, on second thought, will admit is garbled.

It pays especially to be suspicious of graphs and tables. If they are poorly set up, the illogical framework sometimes hides more basic structural flaws. A little thoughtful analysis of relationships (often mere arithmetic) may disclose surprising errors, when a superficial glance would have made it appear that the data had to be accepted at face value. But here I am digressing slightly from the domain of artful general editing into the realm of skilled technical editing.

There is one splendid technique for asking questions. It is applicable to any ambiguous passage, short or long. Whereas the telephone lends itself well to spelling out such editorial doubts, a letter is a poor vehicle to explain to an author why certain of his statements can be interpreted in perhaps three different ways. (To him—knowing his own material—only one meaning appears logical.) It requires wordy explanations of the possibilities in your mind and makes you the perfect bore. Even if you can make yourself crystal-clear, the author will find it difficult to follow your reasoning. He will have a block because he knows what he means and hates to admit that he did not make himself clear.

It would be nice if you could merely use a wavy underscore or similarly vague notation, with a question mark. Half of the time, however, the author—secure in the knowledge of what he means—will fail to understand such a query. (He may ignore it or, at best, may ask you to explain yourself.) Incidentally, never use the wording: "Does this mean this...or that...?" The careless author is likely to answer "yes" or "no," and you will be none the wiser as to whether he had meant to refer to "this" or "that." (Perhaps every editor, as a beginner, has made this mistake at least once.)

The perfect solution is a bold one: think about the possible meanings of the passage in doubt and pick the one you consider most logical. If necessary, toss a coin. Then rewrite the passage to make it express this one meaning only and query the author. Success is inevitable: if you guessed right, the author will applaud you; if you guessed wrong, you will get a howl, but also, as a rule, a foolproof new version. In either case you have won. A great editor with a robust editorial ego, Anthony Standen, likes sending the author the version least likely to make sense ("but only when the weather is fine and the psychology is right"). This is guaranteed to produce a strong reaction and an excellent yield.

Mea Culpa

Some editors believe that any admission of error is nearly always dangerous. I disagree with this legalistic attitude. While it does not help an editor to be saddled

with a weak, guilt-ridden ego that jumps at the faintest chance to recoil, it does not help, either, to be cocky when one is wrong—and sometimes even editors are. Remember, the author is human, too. Nothing is sweeter to one who was criticized unjustly than the melodious tune of an apology. At this sound even the lees of acrimony in an author's heart may yield to the milk of human kindness.

Summary

To devise hard-and-fast rules that might cover every conceivable editorial situation would be tedious, if not impossible. Editing is a decision-making process that must take into account not only objective factors—accuracy and a manner of presentation appropriate to both the material and the intended audience—but also subjective ones. The subjective factors, which must be oriented toward attaining the objective goals, are the ones that especially defy a comprehensive analysis.

Certain techniques can nevertheless be isolated and taught, provided one keeps in mind that they should be applied with flexibility. At the least, some ground rules can be established with the aim of furthering a fruitful interchange of ideas between author and editor. Because of the psychological aspects of this author–editor relationship, mere cost accounting does not necessarily provide the wisest decisions, as when one is trying to choose, for example, between making a phone call or writing a letter. In addition to the fact that use of the telephone may often be less expensive, one might weigh the disadvantages (or sometimes, advantages) of the effect of the dehumanized, unilateral word on paper against that of the pulsing give-and-take of the human-voice response. The way not to get lost in this maze of possibilities is to realize that "techniques" are adaptable as long as the ultimate goal is kept in sight.*

* When I learned how to drive, my instructor tried hard to make me understand that I must look at the road ahead, not at the space in front of the hood of my car.

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From PROCEEDINGS, 1972

The Editor as a Teacher

Sylvia Fourdrinier

The editor who teaches saves money, improves morale, and advances learning. He has unique opportunities to improve writers and writing and editors and editing and thus to aid the dissemination of information and learning.

The editor holds an anomalous position that must make most people wonder why he seeks it. He does not "create." His efforts are devoted to the work of others. His is not the joy of an idea slowly aborning in or sprung full blown from the writer's brain—to be lovingly fashioned into an article or a report. His material is provided for him. Whether he likes it or not, whether he agrees with it or not, sometimes whether he understands it or not—he is committed to working on given material. His primary interest is to make the report or the article or the book better. In this respect he is a teacher.

And he is a teacher not only of the writer whose work he is editing but of the readers who read that work. One of the best ways to write well is constantly to read good writing. Many educators attribute the generally poor writing of technical people to the fact that their textbooks and the reports they read are often badly written. They have so much technical material to read that many of them seldom read in other fields. Editors of technical writing therefore can provide a great service by helping writers to express themselves coherently, concisely, and accurately. Enough good editing may result in a whole generation of technical people who write acceptably. Moreover, the improved books and articles, by being easier to read, may give this new generation time for wider reading. Whether or not this Utopia is ever realized—or recognized—the editor is a teacher. He has however both advantages and disadvantages not shared by the teacher.

A good teacher points out errors to the writer, shows him how to correct them, and explains the principles involved. The finished product depends on how well the student has absorbed the teacher's instruction. The editor, on the other hand, may correct the errors and ensure—depending on his ability—that the finished product is improved even though the writer may have learned nothing. A good editor however takes the viewpoint of the teacher.

If he is a supervisor whose staff may not release reports until he has approved them, the editor has many opportunities to help the writer to improve. He may return a rough draft or outline with suggestions for further work by the writer. He may indicate errors in grammar or rhetoric and tell the writer what books will help him. Then he has the pleasure of reading the report again—and probably again. But after a few such sessions his staff should begin to turn out fairly acceptable reports.

The editor of a journal has a somewhat different approach. His writer is a client. He has—or may someday have—a paper that the editor wants to publish. Again the editor reads the paper; perhaps he has it reviewed by others; and again he passes suggestions along to the writer.

Here, however, the functions of the two editors differ. The supervisor may know almost as much as the writer does about the subject of the report. He certainly knows what he wants the report to accomplish. He is teaching by sharing his experience. The journal editor wants an article that will reflect credit on his journal, that will contribute to its field. He is teaching largely by persuasion. Both of course rely heavily on their positions. The work of the book editor is similar to that of the magazine editor.

A good deal has been written about the relationship between editor and writer: the psychology applied by the one, the tender ego of the other. Inevitably a writer becomes defensive about his writing. It is a creative process even when the subject matter is hardly imaginative. The problem of course is to convince him that the editor's suggestions are intended solely to improve the writing—and consequently to enhance the reputation of the writer. Where the editor looks on his relationship with the writer as a continuing one, he tends to emphasize the teaching aspects of his job. The editor-supervisor keeps hoping that the writer will improve to the point where he needs less and less attention. The magazine editor hopes that the steady contributor will profit from the editing of his early papers.

In the foregoing discussion I am assuming that the editor, whatever his position, knows his job and that his suggestions and corrections can help the writer.

The supervisor who leans on his authority and insists that changes be made because he wants them will not only bruise the feelings of the writer but will fail utterly to convince him that the changes are desirable. Although the bright writer may understand the changes and even apply them to later reports, he will do so under duress. At his first opportunity—presumably when he has been transferred to another supervisor—he will revert to his former habits. Consequently the editor will have failed utterly as a teacher. He may even have imperiled his own reputation, as the writer's next supervisor—who may be at a higher level than our editor—may blame him for not having eliminated the writer's faults.

If the supervisor takes the trouble to explain why he requires a particular organization, why he eliminates some details, why he recasts sentences into the active voice or telescopes phrases and clauses into single words, the writer will usually at least examine the changes with a half-open mind. Sometimes it is necessary only to describe the person to whom the report is addressed. If the writer knows that a nontechnical person—or a person who long ago left the technical area for the managerial—is going to read his report and act on it, he will find it easier to relinquish those fascinating details; he may even be willing to replace some of his jargon with standard English.

The editor-supervisor has a great advantage in that he usually can talk directly with the writer about the work. Preferably he sees drafts as the report progresses and so can forestall much unnecessary writing. It is easy for a writer to omit a page of material that appears only in outline. It is difficult for him to give up a paragraph that he has written and rewritten.

But this close exchange is not always possible. For many reasons a supervisor may sit down to edit a third or fourth draft. Then he must remember that he is a teacher.

Presented as a reasonable request that stems from the editor's understanding of the situation, even a complete rewriting can be accepted without great resentment—if also without great glee. And the writer will learn something about management and how to approach its members.

Usually this attitude is helped by the comforting knowledge that the writer and the supervisor have the same goal in presenting the report.

This comfort is denied the writer whose paper has been mangled by a journal editor, with or without the aid of reviewers. The writer probably has not met the editor; he darkly suspects him of willfulness, perversity, ignorance, and sadism. Far from assuming a common goal with the magazine, the writer knows that he is deigning to impart his knowledge to help the magazine succeed.

Actually, the writer has a large stake in his published article. He is sending forth his creation, signed by his name and his organization's, and he wants it to be as good as possible.

He concedes that some editing for consistency may be desirable. He will accept corrections in spelling; in fact, he expects them. Against any further changes he immediately raises his defenses. There are a few ways whereby the editor can disarm his victim.

One is by not looking on him as a victim or as an opponent. Setting an article in type is expensive. It also is

bound to improve the appearance of any article. Therefore the editor has a strong point. The author is pleased to see his printer's proofs, and his first impression is one of pleasure. But if as he reads, he finds extensive changes that he does not approve or does not understand, his feeling changes to frustration. The proofs look permanent. (And indeed they should be.) If the writer ignores this seeming permanence and replaces his original words and organization, or rewrites the editor's version, he often is told that the changes will be billed to him. This dampens his zeal for changing if not his conviction that changing is necessary. It also as a rule erects a barrier between the editor and writer. The writer scrutinizes proofs of subsequent contributions with an eye only for the number of editorial changes. By this time he could care less about the fact that some of them may truly improve his article. He is playing a numbers game.

If the editor has the time and really desires to be helpful, he can aid both himself and the writer by returning the edited manuscript before it is set in type. He should accompany it with a letter explaining that the changes were made not only to conform with the style of the magazine but also to tighten the writing, to emphasize the important points, or to accomplish whatever he thought desirable. He may invite the writer to review the changes and to reject any that distort his ideas, but the editor should insist that the writer explain his changes. Oddly enough, the number of writers who will note in the margin, "I prefer it this way" is very small. Possibly because of the labor of explaining, most writers will abide by the great majority of the editorial changes, and some will even express gratitude. Apparently it is psychologically sound to offer the writer an opportunity to rebut or to defend. If he doesn't fear that he is being forced into accepting correction, he often does so with little demur.

If an editor encounters a really incomprehensible or ambiguous paragraph, he is well advised to call it to the writer's attention. The more an editor can do to allay the fear of the writer that his work is being callously rewritten, the more the writer will consider the changes and perhaps learn from them.

If there is no time for mailing a manuscript back and forth before typesetting, an editor may annotate the margins of the manuscript to explain his changes. The punctuation of restrictive and nonrestrictive clauses, for example, is not always easy for an editor working on unfamiliar material. Once he makes his choice of restriction or nonrestriction, he should query the writer as to whether he means, for instance, that at a given temperature every vessel will boil over or only those vessels that are constructed in a particular way. When the writer replies, the decision on commas is an easy one. It is probably too much to hope that the beginning writer will remember the question and examine the published work in an effort to see what change his answer elicited. If the question occurs on subsequent papers, however, he may become curious enough to find out why the editor has to ask, and he may learn something about punctuation. Similarly, a writer who uses monotonous simple or compound sentences may learn something about the use of subordination if the editor persistently recasts two or three such sentences into a smooth complex sentence.

In twenty years of editing a society's publications I naturally have encountered many papers by the same writers. In some the improvement in clarity and brevity over the years is marked, so much so that the manuscript editors sometimes grow indignant when a long-time contributor slips (or lets a graduate student write the paper). "What happened to Dr. Jones?" they exclaim. "You'd think this was his first paper!"

Sometimes it seems as though the best proof that an editor is a teacher comes from the evidences of his poor teaching.

Recently an engineer writing against a deadline for the proceedings of an international meeting called for an extension of time. He explained that he had to recast his paper, because the chairman of his symposium had returned it to be rewritten in the third person. When I queried the chairman, he said, "The journal in my field [a very narrow field, fortunately] won't accept papers that are not written in the third person. Scientific papers have to be objective." It is safe to assume that this chairman will not revise his ideas at his age. It is also likely that the young writer will cling to the third person after having had to revise his entire paper.

Besides teaching by directly editing a writer's work, many editors, especially in publishing houses, have a further opportunity to teach by precept. Nearly every publishing house and many large companies have style guides, which frequently are available to the writer.

In some organizations the editorial policy on guides to style permits them to become handbooks on writing if the editor is so inclined. The *Chicago Manual of Style*[1] is of

[1] *A Manual of Style*. The University of Chicago Press, 1967.

course the obvious illustration, but some houses go further than this and include lists of overworked words, recommendations on the use of the active voice, methods of achieving conciseness—whatever they have found that their writers need most. It is essential that these books be correct; it is particularly essential that they follow the rules they offer.

If it is impractical to include handbook material in a style guide, some editors add a brief bibliography of useful and reputable books on writing. Often the prestige of the organization issuing the guide may influence the writer to look at the recommended aids. Indirectly he is learning from that hard-working editor, who probably prepared much of the guide on his own time.

From PROCEEDINGS, 1970

Production Editor: Key to New Effectiveness

David L. McGough

From the initial publication request to final delivery of printed books, technical publications efforts revolve about the central problem of what may be called convergence. This means that someone must be involved in a unique way, from the earliest possible moment, to guide all inputs toward a consistent, economical, effective production effort. The editor can be the key to the convergence problem. New highs of effectiveness are achieved through him when he is utilized in the overall effort as a true production editor. The production-editor concept, actually a production contr l system in miniature, must envision the task as the editing of a book—of a total production—and not merely of words.

Introduction

This paper will present, objectively, the production-editor concept,[1] delineating the basic benefits and concepts applicable to most technical publication production problems. It will deal, successively, with a series of mini-points:

The romance of the job

The production editor's criterion: convergence

A functional breakdown of the task

The importance of a troubleshooting preliminary review

Wise investment of limited time

Coming horizons for production editing.

The approach will be not to flood the reader with details, but, rather, to bring to light certain concepts, priorities and approaches. These, in turn, can trigger an unending list of detailed innovations applicable to each of our respective work situations.

The Romance of the Job

Ride the coattails of engineers and writers into state-of-the-art involvement! Pluck ripe drafts from mature research and development and play a key role in

[1] It is the concept that counts. It can be adapted to fit within the job description of technical writer, technical editor, production coordinator or any other title, as long as the same priorities and approach are observed.

communicating new technologies and equipments. Hover over an entire publication process—like a helicopter traffic cop over a major freeway interchange—and communicate observations which will ease the flow and avoid mishap! Describe it how you will, this is the assignment of job code 007: production editor. Half artist, half journalist, half inventor and half pressroom mechanic, he is the one whose total job awareness can always save dollars, often save time, and sometimes save the day.

Many of the problems encountered in today's complex preparation of technical publications can be avoided. High costs and marginal quality are often results of the lack of planning and coordination in the production effort. Among those who have more than a passing acquaintance with industrial technical publications, most of us have been exposed, time and again, to almost impossible situations the day before a book must go to print. There isn't time to retype original data sheets, which must carry marginal copy, page numbers and footnotes in a book, but must be returned unchanged to the lab. A photograph is missing in the technical section and the engineer that wrote the section is on vacation. Some formerly printed pages to be cut up and used as strip-ins are printed on both sides; nothing can be trimmed off the back without ruining the front. Some of the art planned for reuse is missing from the central file. A three-page insert has been received to be added near the front of the book. Five illustrations which the typist thought were full pages are all drawn as half pages, and the foldout which was to be supplied by another project group turned out to be a 42- by 86-inch master drawing. To top it all off, three numbered equations and two figures are deleted, leaving all figure numbers, equation numbers and their references in the text incorrect! (If you were not employing the production-editor concept, chances are that you missed your deadline.)

The day before I finalized my draft for this presentation I was sitting placidly at my desk at 9:40 in the morning when an unforecast, classified, 58-page manuscript was brought to me by a desperate project's secretary. The package contained, aside from the 58 draft pages, one photograph, three foldouts, 26 pages of bluelined data and 15 pages of poorly Xeroxed art. The secretary's incredible request was that somehow we might have ten copies printed and bound by 11:30! They were delivered at 11:12. No magic, but the production-editing concept and approach made it possible.

Like a miniature guidance system for a three-stage rocket, the production-editor concept usually can give vital assistance from the lift-off of rough draft to a successfully delivered payload of accurate, economical documentation.

The Production Editor's Criterion: Converge

Convergence must be the key to the production editor's effectiveness. Quality demands must converge with schedule requirements in an acceptable tradeoff. Differing terminologies, styles, formats and organization of inputs from countless engineers, technicians and writers must be converged into a consistent draft, meeting all military specifications, as well as customer requirements and internal standards. Rough inputs for art, typing, layout and other production areas all must be prepared and coordinated so that the various outputs will converge in proper size, pagination, classification, line weight, type size, etc.

This real-life version of "mission impossible" calls for the personification of a system which can respond effectively to the mixed demands of proud engineers, irate writers, unfeeling customers, cold military specifications, limited budgets and schedules that are likely to "self-destruct" in five seconds! The production editor can be this person.

If he merely edits words, troubleshoots isolated problems, or helps meet a deadline, his efforts, though valid, are no more critical than those of a hundred others in the production cycle. When, however, he envisions his task as the production editing of a total book—a document—he gains a total job awareness that no one else can contribute to the publication. He must ensure that his own efforts, and his influence upon the efforts of others in the production areas, consistently add to the total harmony, or convergence, of the document. Not only must the first paragraph of the introduction be edited well for spelling, grammar and clarity, but it must converge with such things as the writing style, terminology and reader level of every other paragraph, up to the last paragraph of the summary.

The engineer who wrote the theory of operation may never see the one who wrote the section on maintenance of the equipment. Their jargon may be worlds apart. What one designs to operate at so many hertz, the other may speak of maintaining at so many cycles per second. Where one uses official nomenclature, the other may use equipment description or a model or series designation. Data that are tabulated in one section still may be in unwieldy text in another.

Combining the traits of graphics innovator and business manager, the production editor views, with unique perspective, the functional context of the editing task. His efforts span the spectrum from draft to delivered books. Most of the time his work complements the efforts of others. Through the concept of convergence, however, he adds a vital aspect to the process. The editor becomes a focusing agent. As inputs and instructions leave his hands and go to the various production phases, they begin to project a coherent image of the envisioned book. It is true that he could be deleted completely from the process without creating an actual gap in the production cycle. The book would still get printed. However, much of the clarity, effectivity and economy it could have had would be lost through last-minute compromise, time-consuming corrections, and costly rework of less perceptive production efforts.

To put it in other words, technical publications involve three consecutive aspects: inputs, production effort, and end results. Viewing the task as a whole, however, the production-editor concept regards these as parallel and simultaneous facets of the publication requirement. The editor's primary task is to focus all of them, all of the time, with equal emphasis, toward the final book.

The three aspects of the task can be analyzed further as follows:

Inputs
- Customer—specifications and requirements
- Engineers—design data
- Technicians—validation and documentation data
- Technical Writers—organization and communication

Production Effort
- Terminology—what is said
- Format—means by which it is presented
- Organization—relationship each part is given to the others
- Style—how it is said

End Results
- Reproduction—must be adequate to meet all customer needs
- Cost—must be economical
- Schedule—must meet deadline
- Quality—must be attractive and communicate accurately and effectively

In summary, the inputs must be made consistent, the production effort must be coordinated and the end results must be adequate, economical and on time.

A Functional Breakdown of the Task

The draft input, from technically oriented engineers, technicians and writers, must be divided into several parts for production. Text will go to composition, art roughs to illustrating, special requests to photography, perhaps math and tables in yet another package to composition for special handling. As these different packages are being worked at the same time, all efforts must be coordinated. The efficiency of this coordination is what we are calling constant convergence.

Does all this sound familiar? Nothing truly new to the editing task is being described here; it is only another presentation of the age-old writing and editing disciplines. Unity, consistency, style, organization, format and continuity still must be built into the manuscript. It still must be edited for accuracy, conformance to specifications and standards, compatibility of the various parts, and such basics as spelling, grammar and punctuation. Someone must separate and coordinate input packages, monitor corrections, and maintain quality control through all stages of production. No new editorial practices are envisioned. The production-editor concept is new only in its strong emphasis on practical convergence and on responsibility for easing the process of successive interface, from progressively less professional to progressively more production-oriented groups.

Among professional communicators, the poorest communication often exists internally, among those who are working together in the publication production process. To avoid this, the production editor becomes a specialist in the jargon related to each production area, tending to eliminate "communication gaps." He must learn how to communicate effectively to each area. In today's technical publications, the writer's *picture* is the photography lab's *glossy print* is the illustrator's *board-mounted photograph* is the typist's *figure 1* is the cameraman's *halftone* is layout's *frontispiece* is the pressman's *image* to be centered on the page!

Engineers, writers, editors, illustrators, typists, proofreaders, layout technicians and printers will continue to produce the books. A production editor, working with them and ensuring full convergence of their efforts, can be a key to new effectiveness for them all.

Functionally, the task can be broken down as follows:

One draft must be separated into several packages.

The effort on each package must be made compatible with the effort being expended on all other packages.

Instructions for each package must be given in terminology meaningful to the production group which will handle it.

The final deadline must be reached by achieving several, smaller, in-process deadlines.

The document delivered must satisfy all requirements related to it.

The Importance of a Troubleshooting Preliminary Review

Effective, economical production depends heavily on the production editor's preliminary troubleshooting review. Here, major problems are identified, tradeoffs are considered and shortcuts are planned, when necessary and allowable. The production editor, paring the job to its basic core of problems, considers the resources available, applies prior experience, and sets priorities for solving the problems, in the order in which they will benefit most the overall production effort. Only after addressing himself to the basic problems, determining methods and procedures for their solution and establishing tradeoffs and shortcuts, can he proceed with the remainder of the editing task in a fashion which will ensure full convergence through the production cycle. Aware of each problem's relationship to the overall book, he is now in a position to process all of the rough draft and supporting illustrations, giving instructions for coordinated production of a grammatically correct, fully compatible publication.

Typical problem areas, sometimes not considered until too late, usually will fall into one of the following categories.

INPUTS...must be complete, compatible, and legible; must be identified; pages must be numbered

MATERIALS...may often require special paper or cover stock, special negative material, special screens, adhesives, tapes, etc.

PROCESSES...silk screen, airbrush, color photos or color printing, die-cut tabs, headliner, typeset, special type font, 300-line screen, overlays, etc.

CAPACITY...adequate trained personnel, schedule time, special equipment

SPECIFICATIONS, LIMITATIONS...page limitation; maximum thickness for the binding requested; foldout size printing limitation; conflicting specifications or production requirements (Xeroxing plus negs, etc.)

SEQUENCE...need for preprinted tabular forms; advance printing of pages on heavy stock for mounting color photos; preprinted special repro paper; compatibility of material to be used as is, revised, and generated new; sizing of art; extra drying time for ink on some special stocks before collating or folding

COST...cold shots versus new halftone negatives; pencil drawings versus inked drawings; black and white versus color; retype versus cut-and-galley; reproduction methods.

The magic ingredient is the concept that sees the task as the editing of a whole book—a total production—and not merely words. Almost anyone can sit down at a typewriter, for example, and correct a sentence for you. If they are not familiar with the rest of the text, however, they may get the words right but have the typeface, leading, indention and margins all wrong. Likewise, there are many people in the various production groups that can solve isolated problems. Only the production editor, however, knows the total job well enough to ensure that efforts expended to solve one problem will not create another problem somewhere else in the process. This, again, is part of convergence—the measure of production-editing efficiency.

Wise Investment of Limited Time

To begin with, let us clarify a point: time is always limited on every job. Many jobs start out with noticeably limited time, thus alerting us to the need for planning. But all jobs, however long they may have been in the production shop, ultimately reach the last days of their schedule. Often they find us sleeping. We tend to lose sight of the fact that, at all times, it is the time remaining to delivery that determines the criticality of planning for the final reproduction. Therefore, plans and priorities must be reviewed periodically; that which was of marginal importance yesterday may require careful planning today to avoid becoming a critical problem tomorrow.

Strange as it may seem, numbering and identifying all pieces in the draft input is still priority number one. Each piece should carry both a sequence number (draft page number, figure number, etc.) and some sort of identification (job number or publication number). Establishing sequence and identity is critical to the efficiency, accuracy and economy of all production that is to follow. It also helps ensure the completeness of the inputs as early as possible.

Second priority goes to the troubleshooting review. At this point, judgment is require concerning methods, procedures, priorities and, sometimes, shortcuts or

tradeoffs. If a dime ever held up a dollar it is when otherwise acceptable delivery is delayed because some small problem, discovered at the last minute, becomes impossible. How can you print what you have ready if a handful of items are discovered to be missing, making front matter and page numbering impossible? You will have a hard time delivering that special brochure tomorrow if no one thought to order the special stock last week. Have you ever seen a bindery try to figure out how to side stitch and tape a book that turned out to be two inches thick? Or a print shop wondering about how to reproduce a 34-inch foldout on their 17-inch press? Or a composition department pondering the assignment of running out seventeen composition tapes on two machines at a rate double the maximum rated capacity of the machines? There is rarely any problem which cannot be solved in time if it is discovered at the beginning. Seldom, however, can these same problems be overcome when discovered late in the production cycle.

After the troubleshooting review, the time remaining to delivery must be considered. The third priority should be the budgeting of this time into an editing *plan of attack*. Should time allow, for example, a careful literary edit should be planned, including revision of sentence structure, complete copy marking for consistency, and a final review of edited draft. If it were evident, however, that the draft must be submitted almost immediately to the composition area, various approaches might be taken, dependent upon the judgment of the editor. He might set up a style sheet for spelling, abbreviations, marginal copy, etc. and ask that the typist consistently make the necessary changes in the draft as she types it (this complicates subsequent proofreading). He might edit a few pages for submittal and then see if he can continue to submit edited pages as fast as they are being typed (this won't work if several typists are assigned). Another approach would be to make a copy of the complete draft, turn the original in to the typing group so they can get started on it immediately, and then perform a "simultaneous" edit (this requires that editing changes be held to an absolute minimum, and usually advances the typing schedule at the expense of burdensome corrections and pasteups). Any number of approaches might be taken, each with its peculiar tradeoff of production editor's job awareness which should pay off with the right decision.

This time-budgeting and plan of attack must ensure attention to the three important areas: solution of all remaining problems, provision for various timely reviews of work in process, and advance input to printing of all long-lead reproduction items.

With time and experience, the production editor will gain greater capability for responding to production problems. Reproduction tradeoffs will become his valuable stock-in-trade. He will learn that the image of poor quality pencil or sepia drawings can be greatly enhanced by Xeroxing prior to filming for printing. When time will allow neither halftones nor screened prints, a Xerox document screen can be used directly over a glossy photo for Itek copies, sacrificing quality in order to save time. In galleyed text, when relayout becomes necessary, time can be saved by galleying "away from" a gap or an insert. A page swap often can obviate a lengthy repagination or marginal-copy problem. Printing problems which would otherwise seem insurmountable become more manageable. Huge foldout-foldups can be bluelined and folded for insertion in an 8-1/2" by 11" envelope which has been printed with the figure title and page number and bound into the book. Rubber stamp facsimiles of marginal items, like company logos, proprietary notices and classification markings, often can save the time of reprints on quick-turnaround proposals and reports where one or more of these items were missed in pasteup. Standard page numbers ordered on transfer type allow for advance printing of oversize foldouts, overlays, pages for mounting of color prints, etc., even before page numbers can be determined. The list will continue to grow, adapting itself to the particular problems of any given production editor's capability to respond to the growing demands and unforeseeable problems of today's technical publications production.

Coming Horizons for Production Editing

If production of today's technical publications is both challenging and demanding, what can we say of tomorrow's? Five hundred years ago, Johannes Gutenberg spent nearly five years casting and composing the type for his historic printing of the Bible. It took him three more years to print some two hundred copies of it. Today, computerized machinery can set and compose that same book electronically in seventy-seven minutes! What about tomorrow, when the rest of the production cycle comes equally of age? Will someone speak his text into a microphone...enabling automatic acoustic-signature conversion to basic draft...for processing by character-recognition systems, programmed to eliminate inconsistencies and implement format...automatically input to computer-driven, high-speed, CRT display systems...with page units being laser-scanned for instant reproduction by sophisticated electrostatic printers? If so, who will need a production editor?

I think the emphasis in coming developments, however, will be far more in function than in automation. My own 007-type forecast of things to come in publications would include exciting new challenges which will require careful production editing more than ever before.

Have you seen the growing assortment of talking books on the market as toys? Shades of technical communications! I can see the possibility of tomorrow's handbooks being battery operated. Who can say that the back cover won't fold out and become a blank-apron viewscreen, displaying the illustrations in full detail and color, as projected from a built-in microfilm cassette?

With day-by-day advances being made in diffraction printing for three-dimensional effect, what will keep the exploded views of tomorrow's illustrated parts breakdowns from being fully rendered, three-dimensional illustrations?

As large-scale integration ushers us toward fourth-generation electronics, are we closing our eyes to possibilities such as fault-isolation circuitry actually built into (printed on) a troubleshooting diagram? Could tomorrow's integrated maintenance manuals actually contain electronic capability for tracing maintenance dependency of sophisticated equipment?

All of the above, together with today's new demands for delivery of handbooks at the same time the equipment is delivered, paints a challenging panorama of new techniques to be mastered and utilized. There will be more details, more coordination, more need for convergence of efforts than ever before. The production-editor concept will continue to be a key to new effectiveness...even tomorrow.

From PROCEEDINGS, 1973

Editing the Small Study Proposal

Carl F. Rohne

As the federal government expands its activities in such fields as consumer rights, environmental protection, urban transit, and ecology, more business will be channelled to the private sector by competitive proposals. Discussed below are some successful techniques for creating winning study proposals which can be applied by even the smallest and newest companies. Focusing upon the role of the technical editor, the article details methods for full-scale storyboarding of the entire proposal, the editor's part in creating the technical approach, and varied techniques for handling resumes and related experience. Finally, there is a proposal checklist to help inexperienced proposal teams organize responsibilities and work flow.

Introduction

Although similar in form to other, larger proposals, the small study effort is generally more limited in scope, does not deal with hardware production, and requires a much smaller proposal preparation staff. As a result, it lends itself ideally to participation by smaller companies. Study proposals will be an excellent foil for displaying the talents of the many new, adventurous research and consulting firms which have mushroomed in the last decade and are dedicated to specific areas of relevant research, such as environmental protection, pollution abatement, proper water usage, mass transit, etc. Involvement in the proposal cycle may even prove beneficial to many educational institutions whose researchers have shunned such involvement because government work has been synonomous with defense-oriented work. The clear opportunity will soon exist for beneficial use of both academic and commercial research facilities and talents to create a better way of life for America, using, rather than abusing, our recent technological gains.

A key to successfully submitting a study proposal is to understand the nature of the task and to create, in advance if possible, techniques and staffing to handle it. Below are some of the techniques which have worked successfully at McDonnell Douglas. Though a large company, MDC participates in many smaller engineering study activities in order to build a technology base. Hence, we have gained valuable insight into how to manage and edit small study proposals.

Tone/Style

It is up to the technical editor, in close consultation with the proposal writers, to establish that most ethereal

of qualities, the tone of the proposal. What may be fully appropriate and responsive to the Department of Defense may not be what is required (at least to win) with the Environmental Protection Agency or the Department of Transportation. First, study the tone of the request for proposal (RFP), reading for style and usage. Is it highly structured and formal? If there is accompanying artwork, is it professionally done or is it hand-lettered? Such things can give a clue to the intentions of the procuring agency and an indication of what the writer of the RFP (who may also be the evaluator of your proposal) thinks is important. Second, it is difficult, with little turnaround time, to make the proposal sound as though it emanates from a single source. Therefore, a technique worth trying is not to try to make it sound like that at all. So long as the technical message is consistent, and the styles of the writers can be reasonably harmonized, let each author speak for himself. A trick worth trying is to put a picture and/or a short quotation by the author at the beginning of his section within the technical discussion portion of the proposal. This permits an obvious personal identification with the writer and avoids the monotonous anonymity of many technical proposals. Another technique which appears promising is to provide the reader with a professional synopsis of the author's relevant achievements at the beginning of each technical subsection. This gives credence to the technical analysis, since new companies with slim resources will have to sell their competence (their professionalism, if you will) as well as their creativity. With agreement among editor, author, and illustrator on the use of imaginative type faces, those introductory fillips can be set off from the main body of the text, providing both intellectual and visual variety and stimulation in sections which tend to become laborious.

Storyboarding

One of the most successful small study proposals we ever produced used a full-scale storyboard to depict the entire proposal. Rather than the usual outline of key points, this storyboard contained literally all of the text and artwork, mocked up on four office walls. This permitted the editor and all the authors to have a constantly up-to-date version of the total technical and sales message. Authors could wander in and out of the story room, comparing their text with that of other contributors for consistency of usage and technical content. This precluded the kinds of surprises that sometimes occur at the last moment when deeply buried inconsistencies are at last revealed during management scrutiny. Along with the text, we displayed whatever artwork we had available on a day to day basis. It ranged from quick idea-type pencil sketches to Xerox copies of artwork which our illustrators had already completed. This gave us a good opportunity to see whether the artwork was really enhancing our story, or whether it was distracting. We also found that this system made generating artwork much easier for our engineers, because they were able to grasp what their particular pieces should convey in terms of the total storyboard. The editor should have responsibility for maintaining the storyboard. This permits him a constant "quick-look" capability in assessing the progress of the writing, and gives him the overview he must have in order to edit effectively.

Artwork

In smaller companies, and in most technically oriented companies of any size, the editor, in conjunction with the proposal manager, can have considerable responsibility for the quality and approach of the artwork, if not necessarily for its technical content. Good proposal artwork should be simple, descriptive, and declarative. It should be uncluttered and forceful, enhancing the company's technical message, and adding only clarity and elucidation, never confusion.

Format

Through his experience with other proposals, the editor is in a unique position to guide the physical appearance of the final product. If the RFP does not specify type faces, he can provide useful advice on where words and phrases can be highlighted for emphasis, which headings should be called out boldly, etc. He is also generally responsible for selecting the overall typing (paragraphing/numbering) format and for making sure that the program typists understand it thoroughly. Again, an elegant simplicity should keynote the editor's approach to this phase of his work, as it should to his decisions on style, usage, and artwork. Another technique which deserves a try, where appropriate, is to use quotations from the RFP in a question-and-answer format, with the RFP words set up and then answered, either in brief summary form or in terms of the text which follows. This can be useful whenever the technical approach responds directly to an issue raised in the RFP. It conveys understanding of the customer's requirements, and gives a directness and responsiveness which proposal evaluators frequently have to ferret out for themselves. Such a question/answer technique (with the questions and answers set off in different type faces) helps the evaluator track your response to his procuring document, and should gain

points for the candid company which reveals its "game plan" step by step.

The Technical Section

This section is the bread and butter of the technical proposal, and it alone will occupy more of the editor's time than all other activities combined. Here is where the editor plays his key role. He must take a variety of technical inputs from many sources (often of widely diverse writing abilities) and meld them into a winning effort. Obviously, there are no hard and fast rules on how to do this, but experience has suggested frequently recurring problems and some solutions. Time is the proposal editor's greatest enemy; on-schedule submittals of raw data will give him the time he needs to do a creative job of rewriting. The technical section must not be allowed to limp along, being "thought over," until it is too late to edit it effectively. It is never too early to begin editing drafts, and the synergism of editor and writer, working over the same technical problem, can often suggest just the right way of presenting the message. Then, too, since each draft will contain substantial portions of the previous draft, time can be saved in final editing if those sections have already felt the editor's pencil. Another problem is the inconsistencies in technical message which begin to creep in as each author becomes more intensely absorbed in his own problem. When it becomes obvious this is happening, the editor should simply throw his pencil down, adjust his glasses, lean back in his seat, and really begin to read carefully. A timely conference with one or more writers can often save the frustration of endless reediting of the same material couched in slightly different form, but always avoiding some critical problem. Sometimes, reading and asking questions is the most important contribution the editor will make until the technical section nears completion. At that point, he is familiar with the message, the jargon, and the writer's idiosyncrasies and can do a final comprehensive technical edit.

Resumes

The qualifications and backgrounds of the personnel who will play a key part in making a contract happen are integral to nearly every proposal and will doubtless be even more important in the future. One must bear in mind that new companies, with new ideas to sell, will have to convince the procuring agencies of their ability to get the job done. Established companies have less need to emphasize the qualifications of their experts than newer, smaller companies. Therefore, to be competitive, new companies need to pay careful and thoughtful attention to resumes. We have developed several techniques to handle resumes and personnel qualifications which we feel have merit for the small study proposal. Wherever possible, we include a reasonably flattering photograph of the individual whose resume follows. Again, this gives a personal bond between author and evaluator which can only enhance chances. Generally, all resumes (within one proposal) are prepared (laid out) to the same general format, including name, position within the company (by function, not by organization chart title), education, years experience, and a reverse chronological discussion (not just a listing) of the person's professional activities. Of course, the latter is the heart of the resume, and should demonstrate real professional advancement, increased responsibilities, broadened technical competence, or whatever seems to be the individual's strong points. Finally, we attempt to include related activities, such as memberships in professional societies, recent publications, or responsible positions within nonprofessional societies which may be beneficial to the work contemplated. Again, there are two choices facing the editor here; he can strive for consistency by using individual inputs and then rewriting them to a common style, or he can choose to let each individual tell his own story, attempting only to smooth the style. This latter technique lends itself to extended personal quotations, in which the writer really describes himself to the proposal evaluator, perhaps showing how his experience is "just the ticket" for the proposed endeavor. This gives the resume section a highly personal flavor, and glaring inconsistencies can be smoothed over by the editor. Either way, this section will often turn out to be the very personal responsibility of the editor, who may even choose to employ an interviewing technique to achieve his objectives. We have also successfully employed the concept of abbreviated resumes (both with and without photos), generally arranging them matrix style by function on a foldout-size page. This is useful where there are a number of individuals involved, each of whom will do some small portion of the total task. In such a case, we generally write much longer resumes for several key individuals, including the study manager, his deputy, and perhaps the key task leaders.

Related Experience

In terms of new governmental and privately funded study efforts, this section may no longer loom so ominously as it has in aerospace in the past. After all, if the very concept being explored is radical, a fresh approach, unprejudiced by previous successes along different lines, may be what is really required. Assuming that the

contractor wants some idea of what a company has done, this is the place to parade all relevant past achievements. We have learned to let creative artwork do much of our talking in these sections. Matrices and listings of past programs, along with cost achievements on each, have become a standard device. We also use montages of items produced, photographs of particularly handsome pieces of hardware, examples of written products, exhibits in a second volume, and an absolute minimum of sales words. It is far too easy to sound like a commercial. Therefore, we try to understate our theme and rely mainly upon our graphics experts to do our selling through eye-catching visuals. The key to related experience is that what is cited must be relevant to what the customer has in mind for his study. As an example, the fact that we design and build fighter aircraft does not ensure our competence to design a computer-aided instructional system, unless we used a similar device to design, say, a portion of the Phantom's product support system. Then we have a talking point. Care in selecting and arranging experience should do more than any "trick" in presenting an honest picture of a company's capabilities.

The Checklist

After deciding upon which of these many options to exercise, the editor is still faced with the monumental task (particularly if proposal work is infrequent) of pulling these disparate activities together on schedule. Included here is a checklist (Fig. 1) which should get even an inexperienced proposal team off to a good start and keep them on schedule.

A new proposal team can spend and waste incalculably valuable time on details. Therefore, a checklist can prove an important adjunct to the proposal effort. It sequences necessary steps, assigns responsibilities, and provides daily visual status. The checklist concept is also cost effective, a factor of especial importance to small companies. Time is money, and schedule slippage can mean large overtime bills from artists, photographers, and printers, as well as frayed nerves and rapidly decreasing professional efficiency. A small company will have a difficult time getting twenty or more production people to come in early Sunday morning to put the proposal to bed.

Summary

Government at all levels, as well as many newly organized citizens' groups, will seek new ways of utilizing America's technological capabilities in the coming years. Many will follow the bid/proposal cycle, since, for all its shortcomings, there is no viable substitute at the moment, and it is fair and manageable. Therefore, the opportunities will expand for young companies with new ideas and products to receive their share of these specialized research and development dollars. The technical editor will play a key role in creating winning proposals. By employing innovative techniques for formatting, organizing, typing, writing resumes and related experience, editing, and managing the proposal activity, he will contribute to his company's chances of success and to improving the overall management of this country's technological resources.

ACTIVITY	RESPONSIBLE INDIVIDUAL	NEED DATE
Reproduce RFP		
Determine Staffing Requirements		
Select Key Personnel for Proposal Team		
Contact Editor		
**Prepare General Outline		
*Prepare Proposal Production Schedule (Tentative)		
**Determine Theme of Proposal Effort (Sales Message)		
*Prepare Prekickoff Meeting Package		
**Arrange Kickoff Meeting (Place, Time, Invitee List)		
Notify Invitees and Distribute Prekickoff Package		
Assign Key Sections Introduction Technical Approach Resumes Related Experience Facilities		
*Finalize Proposal Production Schedule (with Publication Milestones)		
*Determine Production Flow (Text and Art)		
*Determine Format (Typing, One or Two Column, etc. MIL-STD if applicable)		
*Prepare Format Sample for Typists		
*Report Production Status		
*Decide Type of Cover		
*Decide Type of Binding		
*Order Covers		
*Print Running Head		

ACTIVITY	RESPONSIBLE INDIVIDUAL	NEED DATE
**Complete Detailed Outline		
*Xerox, Distribute Detailed Outline		
*Typing Responsibility		
*Art Responsibility		
*Editing Responsibility		
**Freeze Configuration Theme		
*Obtain Glossies of Photos		
**Update Marketing Plan/Sales Message		
Prepare Management Sign-Off Forms		
Assign Responsibility for Delivering Proposal		
*Assemble Necessary Management Review Copies		
**Incorporate Management Changes		
**Proofread		
*Page Makeup		
*Alert Printer		
*Xerox Final Copy (Last Review)		
Responsiveness Cross Reference		
*Release-to-print Check		
*Printing Coordination		
Prepare Transmittal Letter		
*Final Check		
Deliver to Shipping/Mailroom		
**In-House Distribution		
**Hold Party!		

*Editor's Responsibility
**Editor Assists

Fig. 1. Proposal checklist

From PROCEEDINGS, 1974

Management's Responsibility in Training the Technical Communicator

Edna Carmichael

Training is instruction designed to prepare a person to do a job. Its basic aim is to develop skills and to increase knowledge—skills to perform effectively and knowledge that enables one to make intelligent decisions. All training must have this objective, but training to prepare one to perform in today's world must do more. Because of swift changes, bringing with them a multitude of complex problems and situations, the need today is for training which, in addition to developing skills, will make it possible for an employee to cope with forces different in nature than those of other times. This training will enable him to work more efficiently in a highly technical and scientific world.

Every day we are made acutely aware of our changed environment. Newspapers and magazines tell us of medical advances—human transplants, miracle drugs, new and almost miraculous techniques; new foods and new uses of products; men in space; and new developments in electronics, to name a few. Technological and scientific changes have advanced so rapidly that keeping up with developments has become almost impossible. Ours has become a technical world.

In the past 25 years or more, publications to instruct have poured from the printing presses—manuals, how-to-do-it books, pamphlets, handbooks, and procedures. Along with this stream of written technical material have come demands from the general public for more and more technical information. Because of demands from many segments of our population, many magazines and newspaper articles now have a technical slant. This trend began during World War II and has never ceased.

Despite the tremendous demand for technical information, there is a shortage of trained technical writers. Neither industry nor government has enough skilled technical writers for the great number of writing assignments to be done. One of the reasons for this situation is that colleges and universities have not undertaken the responsibility for this kind of training. While some courses in technical report writing are available, they do not give serious attention to the needs of one planning a career in this field. Perhaps this is because technical report writing is relatively new and still developing.

To staff their writing departments, industry and government have had to accept employees from other fields and related fields. Teachers, liberal arts majors, and even amateurs have been recruited. Still we do not have enough technical writers. Thus, many organizations have had to train their own.

Despite the wide variation in concepts and approaches to training, as well as comprehension of the term *training*, management now recognizes the need for training though it isn't always sure what it should do or how it should operate. The necessity for greater emphasis on training is clearly indicated by the shortage of skilled technical writers, the inability of colleges and universities to provide the kind of training needed, and the concept of continuous training. Managers are becoming alert to the fact that their relationships with employees depend on the importance placed on training. They are learning that emphasis given to training plays a large part in obtaining qualified workers. This means that training is a vital factor in determining employee satisfaction, productivity, and effectiveness.

Let us look at the technical communicator's role and then see what management must do to enable him to carry out his role.

For purposes of this paper, let us focus on the technical writer and the technical editor. Depending upon the circumstances and need at any given time, one may assume certain responsibilities of the other.

But the role the technical writer most often assumes is that of the author. This is his principal role. He is the generator and communicator of ideas. His aim is to transmit information accurately, clearly, and concisely with a minimum chance of being misunderstood. To be successful, he must preface writing with several activities. (1) He has to gather the facts. Facts are sometimes difficult to obtain, so he may often have to spend much time searching for them. Though he usually has a deadline, he must allow himself sufficient time to follow every lead until he feels he has all of the facts and accurate facts. (2) He must digest or absorb the facts. (3) He must evaluate or analyze their relevance, essentiality, and validity. (4) Next, he has to rearrange them and sort them out. With this preliminary work done, he is ready to prepare a report of useful information, employing the appropriate tone and style.

Obviously, no one can be a technical writer unless he has a fair degree of writing skill. Writing skill means ability to express with clarity, a good knowledge of our language, logical thinking, a developed style, and a consciousness of the reader.

A skillful writer must also be able to view his product as a whole, taking into account the factors that support and enhance the message he prepares. A technical writer, then, must have a rudimentary knowledge of the techniques of the graphic arts and the basic printing processes. Whether one reads a publication or not is influenced by the use of photographs, drawings, typography and printing. The writer need not be an expert in each, but it is important that he know the part they play in his work.

The technical writer's prime responsibility is to prepare clear, readable technical reports that will gain reader interest and serve a useful purpose.

The technical editor has some of the concerns of the technical writer. He too must worry about clarity and conciseness of language, but he can do it with much greater objectivity. Writing is a personal thing and the writer cannot avoid a certain amount of subjectivity as he works. The editor can be detached. He must always keep the reader uppermost in mind, and evaluate a report for reader understanding and effectiveness of expression. This requires him to become analytical, exacting from the writer's mind the ideas the reader needs and that the writer thought he had stated.

This aspect of his role spills over into his analysis of the nonverbal part of the document. Almost always the editor is accountable for making sure the illustrative and tabular material support and clearly express the message of the technical material. He must question what the selected drawings, tables, charts, graphs contribute to the reader's understanding, or just how well particular photos and sketches emphasize points of the text. A final check of headings, figures, tables, and pages is also a part of the technical editor's responsibility.

It is the editor who is held responsible for a policy review of the document. This is a very important part of his function. A mistake involving policy can subject an organization to criticism which may place it in a very unfavorable position. It may result in loss of customers, loss of vital support from important counterparts, and even loss of money. Though the writer is cognizant of policy and tries to prepare his work in accordance with overall policy, he sometimes overlooks or fails to understand all of the ramifications of some policy issues. Final responsibility for checking policy then rests with the editor.

We now see that the technical communicator must be many things. He must be a professional; he must be skilled and competent in several tasks; he must be well disciplined; he must be flexible; he must have a broad general background, and he must have the capacity to grow.

Approaches to training are many and varied. But one approach which seems common to all is that the principal aim of training is development. This means assisting an employee in the acquisition of that knowledge and those skills and attitudes that are beneficial both to him and the organization of which he is a part. This approach assumes that adjustment is necessary. Hence an important and initial phase of training should be orientation or introduction to the job. This part of training is often neglected. Too often managers feel that an employee's knowledge of the job is adequate, and they proceed to get him busy at work as soon as possible. Inadequate orientation or no orientation at all may lead to confusion, misconceptions, frustration, and a feeling of insecurity, all of which can affect an employee's attitude toward the job, and, of course, his productivity and effectiveness.

Proper introduction involves an understanding of the nature, objectives, and scope of the total work of an organization, as well as of a particular task to be performed. Management has critical responsibility in this area of a technical communicator's training. In many organizations, technical writers and editors are considered, in a sense, representatives of management charged with a specific task. Viewed from this standpoint, the extreme importance of this phase of his training is obvious. He must be made acquainted with the organization. Management must see that his agent does not misrepresent him and that he has some understanding of what he is trying to achieve. This means that it must explain and see that he gains knowledge of company operations, its goals, its philosophy, and overall policy. At this point, the knowledge need not be in depth, but it should be enough to permit reasonable performance until it can be expanded. Training in aims and programs cannot be overemphasized, for it enables the communicator to do his job competently and efficiently, acting with self-confidence and good judgment.

Hand in hand with indoctrination in the policies, programs, and operations of the organization as a whole must go orientation to the specific assignment. The technical communicator must know what his job is, the importance of it, what is expected of him, procedures for doing his job, how much authority he has in performing it, and how it relates to the total work of the company. Helping him understand the relationship of his specific assignment to the total work of the organization becomes an essential part of his introductory training. It makes it easier for him to adapt to the scientific and technical changes affecting the work process. Without a comprehension of his role in the total setup, he may find it difficult to make appropriate decisions. With this knowledge and a picture of the overall operation, he can prepare reports in accordance with the viewpoints of his employer.

No technical worker can function well in his job without a good understanding of the basic scientific concepts in the special field in which he operates. A part of management's duty is to review these concepts and make sure they are understood before an assignment is started. Knowledge of these concepts insures that the communicator can be independent and more efficient in the handling of reports.

Organizations with an interest in the technical communicator's freedom to solve problems on his own will provide an opportunity for him to meet staff members in offices and divisions that do work related to his own—printers, artists, distribution personnel, photographers, and others. Time should be allowed for him to become acquainted not only with the people but with the work, the procedures, and the facilities of these offices. In this way, he knows persons to whom he may direct questions and get answers when he needs them. The result can be an employee capable of maintaining expected levels of productivity.

Good performance on any job depends on skill and knowledge, and the importance of training for better quality and performance cannot be overemphasized. This is especially true for any person transmitting information and ideas to be reviewed, evaluated, understood, and acted upon by individuals. Managers often find themselves so engrossed in improving output that they neglect or overlook the factor most critical in getting the improvement they need—elevating the level of competence of those doing the work.

According to Arthur Kuriloff, a management consultant, "capacity and power grow as knowledge and skill increase. And these increase as managers at all levels assume responsibility for teaching and training."

Managers of technical communicators cannot renege on this responsibility. This becomes especially true in light of the scarcity of skilled technical writers, the inability of

schools to provide prepared workers, and the growing importance of continuous training.

As was said before, the technical communicator works at the direction of management, producing literature that represents the thinking of the whole organization and not just a specific part. The success of the whole depends in large measure on the quality of the work of the technical staff and, in turn, on the quality and degree of guidance given by its managers. Thus, management is obligated to assist the technical communicator to fulfill his main role—imparting effective technical information. This requires finding a means of providing him with the tools, skills, and resources needed to develop his communicative powers. It means seeing that he has a good knowledge of communication principles, that he has an awareness of the ultimate aim, characteristics, and value of good communication. He should understand its ability to provide action and to guarantee feedback. He must have an opportunity to observe good writing and to strengthen his command of the English language. He must be provided contact with good writers and be assured time for learning from them. Management must encourage the technical communicator to take advantage of training in this area whenever it is possible. If possible, the company should finance such training. In the interest of a high degree of success in their publications programs, many businesses regularly allocate money to be used for this purpose, and welcome manifestations of interest in training. Good technical writers are an asset to an organization.

Skill at writing requires knowledge of the illustrative and reproductive processes. Management should accept a part of the responsibility for helping writers and editors strengthen their knowledge in this area. Again, employees should be encouraged to take courses, to take tours of facilities, and to attend conferences where these matters are discussed and decisions made. The communicator should know that he is free to talk with personnel experts in these processes. The more knowledgeable he is in this area of work, the more efficiently he can work in producing better publications.

A thorough familiarity with the prevailing concepts in the technical speciality in which he works is mandatory for the technical communicator. Because of accelerated change, a knowledge of the concepts of mathematics, science, and technology in which his work is grounded is a requirement to insure lasting competence. Rapid changes are continuously taking place in these subjects. To remain proficient, the technical worker must keep up with these changes and those in the basic knowledge he needs. Management must make every effort to provide him with this training.

Armed with knowledge, employees can strengthen their forces for fighting the battle to improve quality and performance. Knowing how knowledge frees people to act, management must make sure that the technical staff members know what is going on in the organization. Technical writers not only have a need to know, but they want to know. Managers must see to it that information channels are kept open and that technical writers receive data or information relative to scientific developments and overall policy and planning. When accurate and definitive information is available to them, they are equipped to act constructively in the interest of the company.

Management and other supervisory personnel are taking a new look at the professional and technical worker, and increased attention is being paid to increasing his overall contribution. The concept of training for maximum contribution becomes development. This means growth and involvement. It is the duty of management to provide a climate which nurtures growth. Such a climate would be one filled with challenges—a challenge to strive for excellence, a challenge to be self-motivated, a challenge to promote self-training. It should also be an environment in which he is encouraged to be independent. It would be one in which he is given an opportunity to solve his own problems, in which he is allowed to participate in making decisions affecting his own work, one in which his judgment is sought, and where he is free to make suggestions and recommendations. Through his training to become more independent, he is also trained to be self-confident. An environment of this type is conducive to the release of creativity and the activation of the imagination. An independent, self-motivated communicator whose creative talent is allowed to emerge without too many restraints can make a vital contribution and play a major role in helping his company fulfill its goals.

Obtaining and taking advantage of professional capability in the production of a product respected, accepted, and wanted for its utility is a problem managers must constantly seek to solve. Management must require that technical writers have the professional experience necessary to do an adequate job. The increasing role of the technical communicator in the production of literature demands that he exhibit a fair amount of professional competence. Hence, those responsible for his development must encourage and promote his professional growth and elevate the level of his professionalism. Providing opportunities for contacts with other professionals in the field; permitting time for reviews of professional publica-

tions in his specialty, for participation in professional organizations, and for research can aid managers in this effort. As a technical communicator grows in professional status, he increases his mental alertness and his ability to adjust to change. He then opens the way for making a greater contribution to the organization.

Maintaining professional competence is crucial for the technical communicator. The ever-growing demand for technical information, the rapidity of technological changes and scientific advances, the constant redefining of jobs and missions, and the demand for multiple skills highlight the fact that his training be continuous.

To keep his proficiency high, the technical communicator must continually increase his knowledge and understanding of the fundamentals forming the basis for his skill, must keep abreast of the developments in the technological field in which he works, and must continue to develop those attributes and traits that will permit him to become completely involved and thereby offer all of the talents at his command. Management must see that he has the knowledge, the incentive, the direction, and the environment in which to fulfill himself completely.

From PROCEEDINGS, 1965

A Pitfall for Professionals

John A. Brogan

This paper describes a stylistic handicap forced on many technical writers and editors, pinpoints its origin, and suggests a method for countering it. The problem is the tendency to imitate the turgid styles of the technical literature we constantly read. This tendency is grounded in the learning process: We learn by imitation. The solution is to redirect the tendency toward more lucid and pleasant styles—to intensely read and reread quality literature as a counteractant to the poor literary environment of our workaday world.

Every profession presents peculiar traps of its own—hidden pitfalls that impede the professional growth of its practitioners. Star salesmen become overconfident and lose their drive. Ineptness in office politics subdues otherwise expert administrators. Likewise in technical writing, factors unique to our profession stifle the development of writing and editing skills, frustrating many from attaining their full potential.

A Poor Literary Environment

An inseparable aspect of technical writing and editing unceasingly erodes desirable literary habits: this factor is that, in performing their duties, writers and editors constantly read poorly written and—paradoxically—often illiterate technical literature. Technical writers continually hunt information in engineering reports, memos, technical descriptions, notes, etc., that have been hastily written by engineers and scientists usually untrained for writing and unaware of organized, pleasant, uncluttered writing.

Understandably, no one expects literary quality in these writings. Their authors demonstrate professional competence in their information, not in an impressive style. Nor should the literary shortcomings be criticized, any more than editors or writers should be criticized for lacking the technical knowledge of scientists and engineers.

However, exposure to the awkward styles of these documents progressively cripples the professional skills of writers and editors who must read them. In their role as readers, editors and writers absorb bad habits of literary expression. Keen sensitive faculties become dulled. Their own sentences lose rhythm and become awkward and involved. Ill-chosen words appear. Verbosity emerges. Transitions are not signaled. Organization falters. And ambiguities that would have drawn unpleasant attention earlier in a writing or editing career pass unnoticed. Inured to the understandable failings of nonprofessional writers, the professional comes to accept these faults as natural, even as elements of his own style. The faulty constructions come to "sound right." Habituated to

mediocrity, writers and editors even lose the ability to evaluate and revise their own work. Confronted with crudities, they at most sense a vague uneasiness, whose origin is obscured by the effects of their accustomed reading.

In their insensitivity, they write, permit to pass unchanged, and even defend sentences such as "The questions pertinent to this subject were related to the operational capability provided in the voice engineering service channel described in the technical proposal, in which clarification as to customer requirements were offered," claiming the technical nature of the topic demands complexity. And they thereby disclose the extent of their disability. Their aesthetic literary sense, which normally relishes pleasant, clear writing and is disturbed by poor writing, has been disabled, its normal critical function voided by damaging years of incessant exposure to a poor literary environment.

The increased efficiency of experienced writers and editors often hides the decline, both from themselves and from others. But their advance too often reflects better work habits and more acceptable attitudes, rather than better writing. The writers and editors produce more reams of copy. They recognize and cherish the supervisor's likes and dislikes and take into account his idiosyncrasies. They acquire the department or company style and acquire other similar bits of "practical" wisdom. It is only the insensitivity to jargon, vagueness, and unclarified obscurities that hint of a decline.

Poor writing can unsuspectedly influence educated persons who, knowing the rules of grammar, write under the delusion that writing which accords with them is good writing. Faith in rules and a corollary failure to recognize the living elements in language blind them to aspects of language disclosed only by feel—by sensitivity to sound and its patterns, by consciousness of logical relations, and recognition of superfluous elements not subject to objective, absolute rules. Using their semiknowledge, such persons can write complete, properly punctuated sentences, tenses consistent, subjects and verbs in agreement, yet with the whole befogged with unreadability, because clumsy phrases, inexact vocabulary, and ambiguities make their grammatically correct sentences mislead and confuse rather than enlighten.

Sadly, writing courses seldom counteract the imitative tendency. Usually they furnish only additional, merely abstract rules that have already been memorized many times over since grammar school.

A Natural Tendency

It is natural that we tend to copy literary styles. Much of our active life is imitative. Consciously or unconsciously we acquire most of our knowledge through imitation. Porter G. Perrin observes, "We pick up our language as children by imitating the speech of people around us, and we change our language later in life by imitating what we hear others say or what we find in reading."[1]

Few people are sufficiently original, inventive, or artistic to overcome this innate imitative bent. And technical writers and editors are no exception. Consequently, against their own interests and desires, the work assignments of their profession change their internal subjective standards. Accustomed to gross styles, they embrace them as their own. The form of their own thought becomes recast as they unwittingly copy lame, stiff, disorganized styles. Editors accept awkward phrases, obscure allusions, and ambiguities. Writers begin to treat such faults as necessary ingredients in their own style.

Of course the imitative tendency is not the only factor that progressively degrades the style and sensitivity of writers and editors. Writers tire defending their method of presentation and conform out of exhaustion. They become lax in the face of the continued emasculation of their strong points. They lapse into inexactness, knowing that one of the many reviewers will correct gross errors. They retreat to vagueness and generalities to meet impossible schedules. Editors, likewise, knowing their emendations will be superseded, disregard verbosity and unclear generalities rather than rewrite and risk having to defend their professional efforts to literary incompetents. Often, editors simply lack time for adequate editing, become mere comma inserters and spelling correctors, and thereby become habituated to overlooking blunders.

But these are stultifying factors which merely develop defeatist attitudes. The defeatist is only psychologically numbed. Challenged, he could recall his former abilities. Imitation, however, alters subjective standards and impresses new mental patterns. Consequently, mere volition cannot regain literary habits lost through its influence.

A Counterforce

Fortunately, the outlook is not all bleak. Writers and editors need not despair that their styles will progressively deteriorate; the decline can be arrested and the trend even reversed by redirecting the imitative tendency. Advantage can be taken of a strong counterfactor: that the

mind imitates pleasant writing more readily than gross writing. "It is almost impossible," says E. B. White, "to avoid imitating what one admires."[2] If attention is consciously directed toward attractive styles, the imitative tendency will cause the mind to copy these styles.

By reading the works of outstanding contemporary craftsmen, writers and editors can overcome the work-imposed influence. The redirected tendency to imitate will revitalize the literary aesthetic sense and recast linguistic patterns. The effect will be more extensive, will appear sooner, and will last longer than the effects of workaday technical reading, thus arresting deterioration in style and possibly heightening expository skills.

But merely reading good literature will not suffice. The imitative regression even affects well-read individuals with cultivated tastes. The reading must be a special type of reading-for-writers.

There are many ways of reading. Francis Bacon remarked: "Some books are to be tasted, others to be swallowed, and some few to be chewed and digested: that is, some books are to be read only in parts; others to be read but not curiously [carefully]; and some few to be read wholly, and with diligence and attention."

For our interest, even these three ways do not suffice. Bacon was addressing readers who sought pleasure or ideas, not the study of writing styles and techniques. The needs of writers and editors demand an additional approach—a type of reading that attends to the form, disregarding much of the content. The matter, the thought, or the plot must be treated as incidental, and at times entirely ignored, while concentrating on the author's technique.

Sounds and Their Patterns

Obviously, the proposed remedy must concentrate on the aspects of good writing most lacking in hurriedly written technical papers. And if these notes, memos, and reports lack any single literary feature it is a graceful style, a satisfying flow of sound. Sensitivity to graceful, pleasant sound patterns can be reawakened by attentively reading graceful sentences and groups of sentences both silently and aloud.

Listen to the flow of words, their normal cadence, the hesitations that emphasize, and the subsequent reasserted flow. Read three or four sentences together, listening to the sound pattern as one sentence passes into another. Then read the same group of sentences again, observing the sound patterns of the phrases, the rhythmic flow, and the effects of punctuation. Read entire paragraphs similarly, attending to the same auditory features.

Reread the same sentences and paragraphs, then read them again. Bathe your mind in the flow of their sound. Read individual paragraphs four and five times. Only repeated experiences of pleasant, satisfying sound patterns can offset months of exposure to inferior types of expression.

Sometimes, because the form and not the thought is primary, listen as you might to the words of "Jabberwocky,"

> 'Twas brillig, and the slithy toves
> Did gyre and gimble in the wabe:
> All mimsy were the borogoves,
> And the mome raths outgrabe.

That is, listen not for the idea, but for the rhythm, the harmony, and the balance of sounds.

Such repeated experiences of selected literature redevelops the aesthetic sense as a touchstone for detecting literary quality. The cadence will remain in the mind as a standard for comparison. Awkward sentences, jolting transitions, and ill-fitting phrases will be objectionable occurrences compared to the rhythmic patterns impressed by pleasant literature. John Henry Newman, famed as a nineteenth-century stylist, heightened his style in this way. Taken by the style of Gibbon's *Decline and Fall of the Roman Empire* and with the cadences of Gibbon's sentences ringing in his ears, he rewrote the *History of the Peloponnesian War* in Gibbon's style.[3]

Words and Their Organization

As well as lacking grace, the workday reading of technical writers and editors is disorganized and overly complex. Consequently writers and editors periodically need to review techniques of logical literary development. This can be done by observing how superior authors simplify and interrelate elements. Here the previously described type of reading can return extra dividends. The same literature read for rhythm can often teach organization, economy and simplicity.

Walter Blair observes that, "Almost everything one says when he comments on the good workmanship of an author provides an implied rule for a writer to follow."[4] Attentive critical reading can disclose these rules. College-level textbooks can suggest mechanical features to

observe. Especially valuable can be the instructive examples of good and bad writing. However, subordinate textbook study to analytical reading. The value of the textbook is in furnishing rules to follow and examples to emulate, while acquiring the feel for the living language is, according to E. B. White, "a matter of ear, a matter of reading the books that sharpen the ear."[5]

Study how the author maintains unity of subject. Then determine how he attained it. Observe ways of focusing on the topic sentence. Note the means by which paragraphs and sentences can develop one aspect of the subject and subordinate others. But merely observing the fact of subordination is not sufficient: the goal is to discover how organization is indicated to the reader—for use in your own writing.

Similarly, study the transitional devices that bind sentences together and that relate paragraphs to each other. Determine the devices that lead the reader from one thought to another. Note how the author stresses relevant or important aspects—even by simple phrases such as "most important of all"—simple devices which technical writers too often fail to employ.

Much technical literature obscures fundamental points in complex detailed expositions and loses general ideas among examples intended to clarify. Glance over the techniques textbooks suggest for avoiding these faults, then scrutinize literature for similar and additional methods.

Study how the author expands on an introductory generalization by furnishing examples or by supplying further details. Then determine how the development is indicated to the reader. Observe how the author plunges into a mass of details and ends with a result that embodies conclusions drawn from the facts. Then investigate to determine how the author highlighted the conclusion and pointed details toward it.

Observe how the subject matter can govern the structure of an article. Determine why the author uses a particular structure: does he reach a conclusion following a logical demonstration? Is he presenting ideas in parallel to illustrate their coordinate status? Does his subject matter consist of numerous unrelated ideas he can present only in succession? Then, after discovering his approach, seek out the verbal instruments by which he informs the reader of this relation. He may use a simple introductory "Because of the...," or "For this reason...," or a concluding "..., consequently,..." Or the sign may be more subtle.

Evaluate possible reasons for differing sentence lengths. Does the rhythmic flow decide? Or is it the expository purpose that decides—short, choppy sentences for emphasis; long involved ones for complex ideas.

It's Your Program

The program of studies will be of your own making. It must satisfy your specific needs. Textbooks can suggest relevant areas to be studied. But the reading and the analytic study must be personal. Only private mental involvement can imprint patterns that will counteract work-enforced reading.

This may sound like a big program. The aim is certainly ambitious. But the study is not difficult. The mental operations are actually those employed when writing. At first the novel techniques will demand extra mental discipline. But even then, concentrated application for 30 minutes should suffice. After mastering the techniques, 15 minutes can offset hours of harmful reading.

The literature to be read depends on your interests and writing. College literature books are gold mines of all types and levels of quality writing. The better magazines, such as *Atlantic*, *Harper's Magazine*, and *Scientific American*, contain many rewarding selections. Paperback bookshelves offer illimitable resources for specialized interests: George Gamow on physics, Rachel Carson on nature and wildlife, Bruce Catton in history, George Orwell in politics, Jacques Barzun on teaching, Walter Kaufman on religion and philosophy, Bertrand Russell on almost everything, just to name a few.

Read both novelists and essayists. Read expository writing by master craftsmen like Sinclair Lewis, Joseph Conrad, W. Somerset Maugham, Aldous and Julian Huxley, and Bernard De Voto.

The list is endless. But don't try to read the list. Restrict your reading to an author you particularly enjoy, writing on a subject that appeals to you. Select one article or one section of a book and spend weeks on it. Intensely read and reread a few pages weekly. For only by such intensive reading can we overcome this handicap inherent in our professional activities.

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